

The Canadian Medical Association Journal



Contents

	PAGE		PAGE
ORIGINAL ARTICLES			
Recent Work on the Chemistry of the Blood and Urine. By William Boyd, M.D.	385	Proposed Revision of the Constitution and By-Laws of the Association. By H. B. Small, M.D. . .	442
The Influence of the War on Surgery, Civil and Military; By George E. Armstrong, M.D., C.M.G.	396	EDITORIAL	
Exophthalmic Goitre. By J. K. McGregor, M.B.	406	The Annual Meeting of the Association	458
Actinomycotic Infection — with Case Reports. By A. I. McCalla, M.B.	411	Post-Graduate Courses for Medical Officers	459
The Recent Epidemic of Pneumonia — Bedside Findings and some Inferences. By George S. Young, B.A., M.B.	421	THE ASSOCIATION	
Terminology of Military Reports. By J. A. Hislop, Major, C.A.M.C.	427	Annual Meeting, Quebec: Preliminary Programme	461
Induction of Labour. By F. W. Gershaw, M.D.	430	Hotels	464
A Further Report upon Diphtheroid Infection of Wounds, with a Note upon the Frequency of Diphtheroid Bacilli in Cases of Urethritis and Prostatitis. By R. M. Janes, M.B., Captain, C.A.M.C., and N. O. Thomas, B.A., M.B., Captain, C.A.M.C.	434	OBITUARY	
		An Appreciation of the late Dr. Richard A. Reeve	465
		Dr. Wallace Clarke	466
		Dr. William Burt	466
		Dr. A. Poussette	467
		Dr. W. B. Kennedy	467
		MISCELLANY	
		News, Provincial	469
		News, Army Medical	475
		Book Reviews	478

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RECENT WORK ON THE CHEMISTRY OF THE BLOOD AND URINE

BY WILLIAM BOYD

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IT has become a well-worn platitude that just as there are fashions in clothes so there are fashions in medicine. There are the great fashions, extending over a quarter or half a century, and there are the little fashions which last for two or three years. Fortunately much of what is good in the fashions of medicine is extracted and retained, whilst the gross extravagances which accompany and obscure the truth pass away and are remembered no more.

The latter part of the nineteenth century has been the period of the triumph of the morbid anatomist, although latterly the bacteriologist has tended to displace him. The mighty impress which Virchow laid on medical thought has made us demand a pathological lesion—preferably macroscopic, or if that be impossible, microscopic—for every ill that flesh is heir to. It is possible that we may have been carried too far along this line, if for no other reason than that it tends to make us study end-results rather than the beginnings of disease, which is certainly not in the best interests of the patient.

The epoch-making work of James Mackenzie has taught us that, after all, disturbance of function is the important thing, however fascinating and alluring alterations in structure may prove to be. But we are at once confronted by the great difficulty: How are we to recognize and estimate early alteration in function? In the case of the heart it is comparatively easy, for the symptoms

A paper read before the Winnipeg Medical Society, March 21st, 1919.

are such as to impress themselves upon the patient, and with a gland such as the thyroid the difficulties are not insuperable, but what are we to say in the case of such great and all-important glands as the liver, the pancreas, the kidneys, or the adrenals? The correct functioning of these and other glands is essential for the well-being of that wonderfully complex machine, the human body, but in the past our methods of investigation have surely been both crude and clumsy. We have confined ourselves largely to determining the waste products of the machine, often with no reference to the fuel which was being supplied at the same time. Such methods applied to the study of any delicate mechanism would be doomed to failure. It should be our aim to gain some idea of the morbid processes which are actually going on before any alteration in the nature of the waste products has had time to make its appearance.

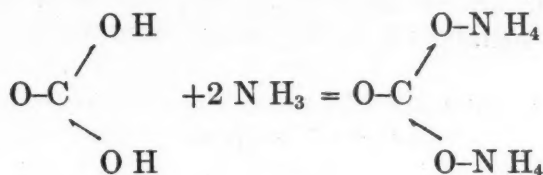
This is the aim of the investigations into the chemistry of the blood which are beginning to assume such an important place in modern medicine. Many of these investigations are laborious and time-consuming, and may not appear at present to lead us to any very definite goal, but for all that, the new weapon placed in our hand is capable of winning great triumphs, and it is possible that these triumphs may in the course of a few years become as remarkable, as epoch-making, as those which followed the early investigations into the character and functions of bacteria.

Most of the recent work has been done on nitrogen metabolism, but before entering into the special methods of investigation it may be well to recall to our minds some facts regarding the manner in which nitrogen is absorbed and disposed of by the body.

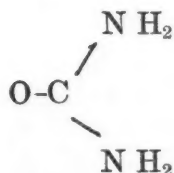
The nitrogen of the food is contained in the protein molecule. The albumens and globulins of food protein are disintegrated by the digestive juices of the stomach and pancreas into proteoses and peptones, and ultimately into amino-acids, of which there is a very large number, but all of which are distinguished by the possession of the group N H_2 . The original protein molecule is a huge complex affair, occurring in the colloid state, and with a molecular weight of, in some cases, over 15,000. The amino-acids, called by Emil Fisher the building-stones of the protein molecule, are, on the other hand, crystalloid bodies of relatively simple constitution, easily soluble and readily absorbed. They have lost all protein characters.

What, then, happens to the amino-acids when they pass through the intestinal mucosa into the portal circulation? Some

are carried through the liver and are distributed to the body generally, where they combine with the tissues and are utilized partly for body building, partly for the production of energy. Others, however, are decomposed by hydrolysis and undergo the process of deaminization, in which the N H_2 group is split off and converted into ammonia. This combines with the carbonic acid of the blood, with a resulting formation of ammonium carbonate, according to the equation.



This is converted by the liver into urea.



Some of

the N H_3 , however, escapes this fate and is used for neutralizing the acid bodies in the blood, in combination with which it is excreted in the urine. If these acid bodies become increased in amount, less of the N H_3 is available for conversion into urea and more is excreted in the urine (combined). It is thus evident that in the clinical condition of acidosis an increase of urinary ammonia will be a sign of great importance, which may make its appearance before the acetone bodies can yet be detected in the urine.

All of the urea, however, is not derived from the amino-acids of the food. There is in the body a constant disintegration of the tissue proteins, and the resulting amino-acids are carried to the liver, where they are converted into urea.

The nitrogen of the body occurs in two great forms: as protein nitrogen in albumen and globulin, with which we are not specially concerned, and as non-protein nitrogen, the latter representing the simple disintegration products or metabolites of the former. The nitrogen partition, a term often used in the modern literature on the subject, indicates the manner in which nitrogen is distributed amongst the various non-protein nitrogenous bodies. Of these the most important are urea, ammonia, uric acid, creatin and creatinine. The last three are the more important of the purin

bodies, which are derived from the decomposition of the nucleoproteins contained in the nuclei of the cells.

Uric acid has a double origin, partly exogenous, from the nucleins in the foodstuffs, and therefore becoming especially abundant after a meal of such foods as liver and pancreas which are rich in nucleins, partly endogenous from decomposition of the nucleins in the body tissues. Creatinine, derived from creatin in the tissues, is entirely endogenous in origin, being independent of food ingested, and thus affords an accurate and important index of the state of nitrogen metabolism in the tissues themselves.

TABLE ILLUSTRATING THE BEHAVIOUR OF SOME CONSTITUENTS OF THE BLOOD IN URÆMIA AND DIABETES

Condition	Total N. P. N.	Urea N	Creatinine	Sugar
		Mgms. per 100 c.c.		Per cent.
Normal.....	25-35	12-20	1-2.5	0.08-0.12
Uræmia.....	80-350	50-300	3-7
Diabetes.....	0.15-1.30

All of the above non-protein nitrogen substances are excreted in the urine, and their estimation either in toto or individually affords valuable evidence of conditions of disordered nitrogen metabolism. Still more important information is afforded by their estimation in the blood, for, in the language of scripture, it is not that which passeth out in the draught which defileth a man, but that which remaineth in the blood.

Methods of chemical analysis may be applied to the urine or to the blood, in some cases preferably to both. Let us consider first the case of the urine.

The clinical condition in which chemical examination of the urine is most frequently used is, of course, nephritis. In investigating such a case the examinations which afford most information, apart from that for albumen, are those for total nitrogen and for chlorides. These should be coupled with estimations of the specific gravity of two-hourly specimens taken during the day and one of the night urine, together with the use of the phenolsulphonephthalein test for urinary excretion. These tests to be accurate and of real value should be carried out with the patient on a standard diet of known constitution, such as that of Mosenthal, especially with regard to the amount of chlorides ingested. The normal response to such a test meal is 11 gms. NaCl and 11 gms. N. In

parenchymatous or interstitial nephritis there is a marked drop in the chlorides which may amount only to 2 or even 1 gm., and a less marked drop in the total nitrogen, which, however, in advanced cases may reach 5 gms. or less.

In the Mosenthal test for renal function the most valuable information is probably afforded by estimating the variations in the specific gravity during the twenty-four hours. In health this should amount to at least nine points, and one of the earliest pieces of evidence of impairment of function is a fixation of the specific gravity, the variation falling to considerably below nine.

The estimation of the urea in the urine has somewhat fallen into disrepute owing to the inaccuracy of the hypobromite method, but the modern urease method of Marshall has added immensely to the value of the test. An increased excretion of urea occurs in fevers, owing to increased destruction of proteins, and a marked increase is seen during the absorption of an inflammatory exudate, and in the resolution stage of pneumonia. In these latter conditions there is a corresponding increase in the chlorides, for these salts are bound up in large quantities in the pneumonic exudate and in pleural and peritoneal effusions.

The urea is markedly diminished in diseases of the liver, especially in such a condition as acute degeneration. In these cases the ammonia excretion is high, for only a small amount of it is converted by the liver into urea. In nephritis there is a diminution in the urea, but only when the disease has reached a stage when it can be diagnosed by simpler methods. In such cases there is a corresponding increase in the blood urea. Here we have an example of the value of combined blood and urinary tests. A diminished urea output in the urine may be due to diminished urea *excretion* due to renal disease, or to diminished urea *production* due to disturbance of liver function. An examination of the blood urea will at once differentiate between these two conditions and establish the diagnosis.

Reference may be made at this point to Ambard's coefficient. This expresses the relationship between the concentration of urea in the blood and the amount of urea excreted in a given time, that is, the rate of excretion. In health this coefficient is very constant, but in renal disease there is a relative increase in the concentration in the blood and a relative decrease in the rate of excretion in the urine.

Next to urea the most important non-protein nitrogen constituent of the urine is ammonia. This, it will be remembered, is

derived from the decomposition or deaminization of the amino-acids, partly of the food, partly of the tissues. The N H_3 of the blood serves one extremely important function: It is one of the chief factors in keeping the reaction or hydrogen-ion content of the blood at a constant level. When inorganic acids are ingested in the food, the N H_3 in the blood combines with and neutralizes them, more N H_3 appears in the urine, and less is converted into blood urea. Exactly the same thing happens when the organic acids in the blood reach a pathological level, owing to the faulty metabolism of fats. In the acidosis of children, in the acidosis following surgical operations, and most of all in the acidosis of diabetes, the N H_3 combines with the abnormal acids in an endeavour to preserve the alkalinity of the blood, and is therefore excreted in very large quantities in the urine. The important fact to be noted is that this increase often occurs a considerable time before the appearance of acetone bodies in the urine. In diseases of the liver, particularly in cirrhosis, there is often an increase of ammonia in the urine, owing to interference with the normal conversion of ammonia into urea by that organ.

Let us turn now to the other great method of investigation, the chemical analysis of the blood. It is important to know what products of protein metabolism are being excreted from the body, but it is still more important to know which are being retained in the blood. A study of blood chemistry shows, moreover, how the balance is being maintained between production and excretion, and it is this balance which is the important thing from the point of view of health.

The products of protein metabolism are represented by those substances included under the term non-protein nitrogen which we have already considered, the most important being urea, ammonia, uric acid and creatinine.

Estimations of the total non-protein nitrogen are of considerable value. The normal figure is from 25 to 30 mgms. per 100 c.c. In renal disease this becomes much increased and may rise as high as 350 mgms. per 100 c.c. In chronic passive congestion of the kidney there is no retention, but in advanced nephritis the figure may be very high. Patients with over 100 mgms. usually die in four or five weeks, even though the phthalein excretion may be fairly good. In uræmia the non-protein nitrogen is always very high, but it is interesting to note that in eclampsia the rise is seldom marked. A marked elevation of non-protein nitrogen makes a patient a poor operative risk. Finally it may be remarked that

Tileston and Comfort in a series of one hundred and forty-two cases found a considerable degree of retention in 36 per cent. of all syphilitics examined.

The method for estimating the total non-protein nitrogen in the blood is somewhat complicated, and data of equal value can be obtained by the much simpler methods of study of blood urea and blood creatinine.

Urea. Until very recently our only clinical method of estimating urea in the urine was the notoriously inaccurate one by means of sodium hypobromite, which, moreover, could not be applied in the case of the blood. In 1912, however, Marshall showed that the soy bean contained an enzyme named urease which had the power of converting urea into ammonium carbonate, and which acted on urea alone. This at once furnished an extremely accurate method of estimating the urea not only in the urine but also in the blood. The ammonia is driven off from the ammonium carbonate, collected by bubbling through acid, and the amount estimated by titration.

Urea constitutes 50 per cent. of the total non-protein nitrogen of the blood, and its estimation often affords information which throws a flood of light upon a case. Suppose, for instance, the urine urea of a patient is found to be very low. This may be due to one of two entirely different causes. It may be owing to inadequate renal excretion, whereby the urea is held back in the blood, being produced in normal amount. In this case the blood urea will be above normal to an extent proportional to the kidney defect. On the other hand, the low urine urea may be due to an insufficient formation of urea owing to some lesion of the liver, such as cirrhosis, carcinoma, acute yellow atrophy, or the lesions of eclampsia. In this case the blood urea will be low, or at any rate not above the normal. This examination of the blood will explain the significance of the abnormal condition of the urine.

Let me briefly describe a case which illustrates these points. A few weeks ago a patient in the Winnipeg General Hospital developed eclampsia. The urine urea was 0.6 per cent. (normal 2 per cent). This might be due to retention of the urea or to defective formation of urea. The ammonia in the urine was 0.28 per cent. or four times the normal. As urea is formed from ammonia, the conversion taking place in the liver, these findings suggested that the liver as well as the kidneys was at fault. That the kidneys were in a perilous state was shown by the presence of a very large amount of albumen and of epithelial casts in the urine.

The blood urea was now estimated and found to be 16 mgms. per 100 c.c., i.e., within normal limits. If the case had been one of pure uræmia the figure would have been over 100. There was, therefore, deficient urea production owing to hepatic disturbance. At the same time there was some degree of retention due to renal disorder, otherwise the blood urea would have been below normal. The most significant fact discovered, however, was that the creatinine in the blood was 8 mgms. per 100 c.c., on which finding a fatal prognosis was given. The patient died within twenty-four hours.

The estimation of blood urea is of great value in urological surgery, not so much in diagnosis as an aid to prognosis, and in estimating the operative risk of a case. In kidney and prostatic cases if the blood urea is much above 100 the patient will most probably die shortly after operation from the development of uræmia. An estimation of the variation in blood urea from week to week will afford valuable indication as to the prognosis in these surgical cases, a falling urea being a hopeful sign, a rising urea a bad one.

Creatinine, although constituting only 2 per cent. of the total non-portein nitrogen of the blood, is nevertheless of great importance in arriving at a correct prognosis. We have seen that urea and uric acid have both an exogenous and an endogenous origin, that is, they are derived partly from the food ingested, partly from the metabolism of the tissues. The creatinine, however, is entirely endogenous in origin, and is thus a most important indication of the state of tissue metabolism. Moreover, of the three substances, urea, uric acid, and creatinine, creatinine is much the most easily excreted. Its retention is thus an indication that a most serious degree of renal inadequacy exists. The normal figures vary from 1 to 2.5 mgms. per 100 c.c. It may be said that a finding of over 5 mgms. indicates a fatal prognosis. The higher the figure the more rapid will be the termination. In uræmia it may be as high as 30 mgms. Further, in some cases of high blood creatinine there may be a fair phthalein excretion. In these cases a bad prognosis must be given. As a rule, however, the two parallel one another fairly closely. Finally, in cases with no phthalein excretion there may still be variations in the creatinine content, on which the prognosis may be based.

In a paper of this length it is not possible to touch on some of the finer points of nitrogen blood chemistry, but the more important aspects have been dealt with.

In the time that remains we may consider a few points in connection with the metabolism of carbohydrates. Glucose, the chief sugar in the foodstuffs, is absorbed into the blood without any of the complex changes which the proteins have to undergo, the starches being converted in the intestine into sugar. Some of this sugar is stored in the liver as glycogen. The remainder is carried to the tissues, where it plays the part of fuel. The concentration in the blood is kept at a remarkably constant level, from 0.08 to 0.12 per cent. If the figure rises above 0.2 per cent. the kidneys are no longer able to hold it back, and it leaks through into the urine. The metabolism of the carbohydrates is dependent on and is regulated by the internal secretions of some of the ductless glands, chief among which is the pancreas. The pituitary, the thyroid, and the adrenals all, however, have an important relation to carbohydrate metabolism.

The amount of sugar which appears in the urine is by no means a certain indication of the condition of a diabetic, although of course a very valuable one. Not until the blood sugar has returned to normal limits can the patient's condition be regarded as satisfactory. Recently I encountered two cases which demonstrated in a striking manner the value of blood sugar determinations.

The first patient was admitted to hospital for an operation for inguinal hernia, but it was discovered that his urine contained a large amount of sugar. This was estimated and proved to be 6 per cent. The question arose: was this patient in a dangerous condition of diabetes? I examined his blood sugar and found that it was only 0.18 per cent. A few days of dieting made the urine sugar-free. Such a patient would, of course, need to be careful, and ought to have his urine tested at intervals, but his condition was certainly not the alarming one indicated by the preliminary examination of the urine. He must have had a very low renal threshold, and the slight excess in the blood all passed through into the urine.

The second case was one of diabetic coma. Here there was only 3 per cent. of sugar in the urine, but the blood sugar had reached the enormous figure of 1.3 per cent. The patient died next day. From the point of view of prognosis the gravest error would have been made by trusting to a urinary examination alone.

Finally, a word may be said regarding muscular dystrophy. The aetiology of this obscure condition has been shrouded in mystery, but evidence is now forthcoming which points to an involvement of one or more of the endocrine glands. Several cases have been

recorded in which the blood sugar is well below the normal, and we have at present an obscure case of dystrophy under observation in which the blood sugar is remarkably low, with a correspondingly high sugar tolerance.

Acidosis. Closely related to disorders of carbohydrate metabolism is the subject of acidosis. In health the fats are burned up in the carbohydrate fire to non-toxic products. This combustion is complete as long as there is at least one molecule of carbohydrate to three of the higher fatty acids. In diabetes this ratio cannot always be maintained, with the result that the fire begins to smoke with acid bodies from the incompletely burned fat. These acid bodies accumulate in the blood, and are neutralized by the bases of the blood, notably ammonia, as well as being taken up by the "buffer" action of such salts as disodium and monosodium-hydrogen-phosphate. The result of all this is to bring about an impoverishment of the bases of the body, and thus an inability on the part of the blood serum to combine with and eliminate the acid CO_2 . The clinical result is the appearance of the symptoms we know as acidosis.

Acidosis may be recognized by the appearance in the urine of the acetone bodies: acetone, diacetic acid, and oxybutric acid. Prior to this appearance, however, there is an increase in the combined ammonia of the urine, since the ammonia of the blood neutralizes the acid bodies to the best of its ability, and is excreted in increased amount. The acidosis may also be recognized by means of various tests applied to the blood, of which the most valuable is the determination of the power of the blood serum to combine with and carry CO_2 , a power which is invariably diminished in acidosis.

The presence of acetonuria must not, however, be regarded as certain evidence of acidosis, for acetone bodies may appear in the urine without any diminution in the CO_2 carrying power of the blood. Further, there may be a true acidosis without any acetone bodies in the urine, as for instance in the retention of acid phosphates which often occurs in nephritis. When there is great disturbance of liver function, as in delayed chloroform poisoning and in the toxæmias of pregnancy, there may be marked acidosis with large amounts of lactic acid and of ammonia in the urine, but with only a small amount of acetone bodies. Such cases are due to disturbance of nitrogen metabolism, rather than to that of carbohydrates.

The list of clinical conditions in which acidosis may play

a more or less important part is being continually added to. The most important are diabetes, post-anæsthetic conditions, starvation, infantile marasmus, the cyclic vomiting of children, pregnancy, advanced nephritis, various febrile diseases such as pneumonia and cholera, and conditions in which a deficiency in the oxygen-carrying power of the blood leads to asphyxia. It is a curious fact that a sojourn at high altitudes always produces a well-marked acidosis.

The subject of the chemistry of the blood and urine is an enormous one, and I fear that I have treated it in but a cursory manner. I trust, however, that enough has been said to convince you that the possibilities of these methods of investigation are great, and that chemistry has joined bacteriology in offering her services as handmaid to the practicing physician and surgeon.

ORDINARY disease germs die very readily, or at least lose their power of producing disease when they are dried. An investigation of the library books of a big city, by the method of tracing the history of books known to have been used by infectious persons and then passed on to others, revealed the fact that during the several years covered by the investigation no case of disease was traced at any time to such books. While it is theoretically possible for books to carry certain infections it is very rare. The reason why it is rare, depends upon the fact, that such infection to produce disease must be placed in the book in the form of discharges from the nose, mouth, bladder or bowel of the patient, and must then be removed, usually by the hands, to the mouth of some other person almost immediately, whilst still fresh, and possibly even moist. It will readily be seen that these conditions seldom occur. The old idea that the germs of disease are very resistant and could remain dry for a long time, while yet retaining their ability to reproduce the disease is based upon a fallacy which has been exploded. It is true that the first disease germ discovered (anthrax) is very resistant and may remain dry for twenty years, or even more, and yet be capable of producing disease at the end of that time if it should reach the body of a man or an animal. By analogy it was supposed that the same thing would be true of other disease germs such as those of tuberculosis, scarlet fever, etc. Later investigations, however, showed that anthrax was a striking exception rather than an example of the rule.

THE INFLUENCE OF THE WAR ON SURGERY, CIVIL AND MILITARY

BY GEORGE E. ARMSTRONG, M.D., C.M.G.

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THE art and science of war surgery is the art and science of civil surgery. This has been true through the ages. During each period of the world's history our profession has given of its best to the Army and Navy in time of war.

It has been said that war surgery is something different from civil surgery: that war surgery has been of a rough and ready kind. Speaking from my experience in the present war, this view is erroneous, and can only be held by those not fortunate enough to have seen any service overseas.

The instruments of warfare are the end results of the pre-war educational, moral, social, intellectual and scientific attainments of the nations engaged. War reveals to the world the fundamental character of the people developed during peace. It is the clearing house that appraises without favour the quality of the political, religious, and educational organizations that have made the people of the nation what they are. It brings out and demands the best of each one. The perfection of the present organization is seen in the supply, transportation and direction of millions of men moved and controlled by one master mind.

The principles of war surgery are those developed, taught and practiced by the masters during peace. They are the same in Flanders Fields as in the Dutch, Swiss or American civil hospital. One might say that during war the work assumed more the character of acute surgery, and yet at the base there is, sad to say, gradually accumulating a mass of chronic surgery that will call forth all our energy and all our resources.

There is a difference, however, between civil and military surgery. In the latter, probably less variety, but certainly a very great preponderance of emergency conditions, of wounds, of muti-

lations, of multiple and complicated injuries; associated injuries of soft tissues, of hard tissues, of nerves, together with penetrating wounds of the abdomen, chest, and head. We have more frequently to deal with hæmorrhage, shock, and virulent infections.

There is another difference about which very little is said. War surgery at the front is often carried on under distracting and terrorizing conditions, sometimes associated with personal danger to the surgeon as shown by the casualty lists. All this is in striking contrast to the quiet of a civil operating room with walls decorated by requests for silence, sometimes printed in several languages.

During war a large experience is gained in a short time, limitations are quickly reached and defects ruthlessly uncovered.

The combatant army is always demanding more and greater perfection and the Army Medical Services are constantly called upon for greater and still greater efficiency in conserving the man power of the combatant forces.

The present war has eliminated many false ideas, improved and perfected sound principles and methods, and developed to a surprising degree certain fields of surgical activity, that were only imperfectly appreciated before.

The number and varieties of wounds have been so large that opportunity greater than ever before has been afforded for a complete study of their pathology and methods of repair.

Our pre-war ideas of the treatment of wounds of the soft and hard tissues have been modified. Changes that are indeed radical have occurred in our estimate of the value of antiseptics and drainage. Occasion has been offered to acquire in a week a wider experience and a greater knowledge than could have been gained in a lifetime in civil surgery.

The relative value of mechanical and drug cleansing of wounds was quickly determined and led to the adoption of ways and means better than we had before. The primary suture and the delayed suture, developed at our clearing stations, have saved many a poor fellow weeks and months of suffering and painful dressings, as well as thousands of lives.

A conspicuous advance has been made during the war in treatment of nerve wounds. The few cases observed before the war broke out had not enabled a complete study to be made. We were surprised at the number of cases of peripheral nerve injury. We were suddenly confronted with so many facts unlike one another that there was great confusion in classifying and interpreting,

and above all in pronouncing them amenable or not to surgical intervention.

To quote Dejerine, "we had first to establish the exact signification of the variable and differently associated symptoms met with in all the cases, to specify the diagnostic value of partial or total paralysis, of muscular hypotonia and electrical disturbances; of anæsthesia, of paræsthesia, or pains in their various modalities; to throw light upon the problem of vasomotor, secretory, or trophic disturbances, at times so intense, or at other times scarcely perceptible, and above all to connect each of these symptoms with the determining lesion."

Histological study, experimental investigations and the large clinical experience gained during the war have solved many of these problems. The peculiar characters of neuromata and pseudo-neuromata are in great part determined. We have learned when to advise surgical intervention.

These histological and experimental discoveries have demonstrated the illogical nature and uselessness of certain interventions and the utility and rationale of others; they have not only encouraged the practice of simple liberations and of nerve sutures, but they have also thrown light on many aspects of surgical technique.

The knowledge thus attained is being diffused through all branches of the medical services of the Allies, and will reach all those interested in medicine through the usual channels, the universities and medical literature.

One might enumerate many other diseases and injuries, the pathology, diagnosis and therapy of which have been similarly advanced during the war; such as penetrating wounds of joints, compound or open fractures of the femur, intrathoracic and pulmonary lesions, injuries to the head and central nervous system, injuries to the blood vessels, mutilating wounds of the face, and intraperitoneal wounds.

Many factors have contributed to the material progress made in so many directions. Of course, one must place first opportunity, as offered by the large number of cases of similar injury. Next I would put the association of surgeons of different nationalities, and speaking different languages, in a united effort, or in other words, concentration of energy. Next in importance I would place the opportunity afforded to surgeons to visit each others clinic or hospital centre, and the education and stimulation

to greater effort that must necessarily follow, the exchange of ideas and inspection of methods and results obtained.

The incentive to work, to devise better ways, to discover more potent methods is the greatest possible. The burning desire to do one's best for those wounded on the field of battle comes to one and all with an intensity never before experienced. Men not previously noted for their energy nor for any very extraordinary ability, have developed into something approaching genius in some special line of work. Several such might be mentioned. I may add that others, who in pre-war days had achieved notable success by other than scientific attainments, have been quickly appraised and have fallen by the wayside.

No conditions or surroundings have come under my notice that have more quickly and correctly established a man's value as a surgeon, than the work of the casualty clearing station. In these stations he is not working alone but side by side with his peers. The consultant of the district has him under his eye. He must deliver the goods or stand by. The character of the work is estimated by three standards: Mortality, military usefulness, and post bellum national value as a citizen.

There are a great many who can speak more authoritatively on the medical and surgical work near the firing line than I can, but from what I have seen and read and heard, I am convinced that the organization there is most efficient, and that all that medical science has to give, together with a loving devotion to duty of the personnel of the different Army Medical Corps, regardless of fatigue, distress or danger, is given freely to the sick and wounded officers and men of the armies of the allies. The numbers are so large that the value of any suggested therapeutic measure is very quickly and withal very accurately determined. This being done, the knowledge is quickly passed along to the different Army Corps for adoption.

The work done at the casualty clearing stations is most important. Early in the war it was learned that the surgical work here demanded the time and energy of the most sane and judicial minds, and young men who could stand up for many hours under great physical and mental strain. It is no small thing to be able to say, that members of our profession have stuck to their job twenty-four, thirty-six, forty-eight hours, and even for longer periods, ministering to the needs of the sick and wounded.

Your criticism of this expenditure of energy is obvious and has been met. Team-work—teams coming on in relays have

taken the place of individual effort to the great advantage of the patient and the personnel. It is a special work, It demands a special training which is quickly acquired. Men at the casualty clearing station soon learn in what cases to give salines, blood transfusions, and the usefulness of drugs. They acquire a perfection of detail in the treatment of wounds of soft tissues, of nerves, of hard tissues, of the central nervous system and of the viscera, that cannot be obtained in any other way, and they seem to acquire a sense of smell for shrapnel.

The next sphere of greatest responsibility is the Base, where some can be made fit again for service but where the problem arises of restoring men of no further military value to civil life in as good a state as possible.

The place for the ablest and most experienced young men is the casualty clearing station. The place for the ablest and most experienced older men is the Base, where reconstruction may be carried out more leisurely.

A feature of the work of the Army Medical Corps during the present war is the gradual appreciation of the advantages of specialization in medical and surgical work. Indeed I may make it stronger and say that the war has demonstrated the necessity of specialization in war medicine and surgery. Perhaps I can make my meaning clearer by reference to one or two specific conditions: The treatment of fractures of the femur is an example of the improvement in and results obtained by specialization. Until General Sir Robert Jones was called on to bring order out of chaos the results from these fractures were lamentable.

This master mind was given charge of all fractured femurs. He installed his method in different centres. The femur cases were detained in France until they could be transported without injury. One of our Canadian hospitals had three hundred femur beds, and in one district I saw over a thousand. The system is now installed in England. Selected medical men were trained in the details of the methods and devoted their whole time to the work. The situation was changed. The end results were immediately improved. The period of disability was shortened and the mortality lowered. They recovered with full or nearly full length, with good alignment, functioning joints and a healthy musculature. Many other examples might be mentioned in surgery, and, as many in medicine. In one hospital in England are assembled all the face cases; mutilations and destructive injuries of the face, including

the mouth, nose, eyes, and ears. Imperials, Canadians, Australians, New Zealanders and Americans are here closely associated in one hospital to do special work in reconstruction.

The united effort of these men is very satisfactory. They are doing a work that can be fully appreciated only by those fortunate enough to see the cases from the beginning to the end—or better still from the front line to the finished product.

This work will be handed back to the civil profession illustrated by photographs, plaster casts and wax models made by artists. I am happy to be able to say that Sir Robert Borden has taken a practical interest in this educational side of the matter, and that our Canadian Government has given the C.A.M.C. a sum of money to provide for our War Museum a very creditable illustration of the work by these artists.

There is another subject about which I would like to say a few words. It does not illustrate the influence of war surgery on civil surgery, but rather the reverse. It shows the application of the practice of civil surgeons to the different and more difficult conditions that obtain near the front during war.

It has doubtless been the general opinion of surgeons that intra-abdominal wounds occurring during the fight were best treated by the expectant plan. Certainly up to the time of the South African war it was believed by many that the operative treatment of abdominal wounds was not indicated under war conditions.

The reasons given were that to be successful the operative treatment must be instituted early; that favourable conditions that would insure success did not exist at the front; and that experience taught that a larger percentage recovered under expectant than after active operative treatment. The expectant treatment was the orthodox one when the South African war broke out. There were surgeons who were inclined to challenge this opinion, and notably Surgeon-General W. F. Stevenson, but the attempt to obtain better results by operation was rather a failure.

The conditions in South Africa were particularly difficult. It was, on the one hand a new, unsettled country of great distances with a bad water supply, and on the other hand a dry climate and a virgin soil. Wounds often healed kindly under a first dressing and scabbing. Conditions during the present war have been in many respects quite the reverse. The fighting took place in an old settled country, with a damp climate and a soil fertilized for centuries and full of pathogenic organisms. Above all, the fighting

line was for long periods of time almost fixed, It is probable that some penetrating wounds of the abdomen recovered in the South African war. Recovery would be more likely after clean bullet wounds. Time is an important element; operative treatment must be instituted early to be successful.

In the early part of the war the usual routine treatment was rest, the Fowler position, no food, or water for three days, and the administration of morphia. The distressing thirst was only partially relieved by mouth washes and rectal salines.

To obtain anything approaching an accurate estimate of the success of any method of treatment the cases must be followed after they leave the casualty clearing stations.

Wounds of the small intestines are often closed for a time by eversion of the mucous membrane, contraction of the circular muscle near the wound, and adhesions of omentum, and neighbouring coils of intestine. It thus comes to pass that a patient with penetrating wounds of the intestine may be evacuated from the casualty clearing station in apparently good condition after as long a period as two, three, or even four days, and yet arrive at the Base almost or quite moribund. Only by following the after history of these cases can the surgeon at the casualty clearing station learn the end results. Surgeons have been deceived as to the value of their methods by the good condition that obtained when the patients were evacuated.

Another reason for employing operative methods in abdominal wounds is the frequency of hæmorrhage. Autopsies have impressed this fact upon us.

Souttar with the Belgian Army, and Owen Richards with the British Army, were among the first to adopt operative methods. Since the early part of 1915 the operative treatment has been carried out as a routine whenever thought advisable, and as early as possible, that infection and hæmorrhage might be anticipated and controlled, and this work has been done as near the front as practicable. The mortality has unquestionably been lowered. It is still high, probably not much below 50 per cent., but even that means many lives saved.

The war has brought into closer daily association the surgeon and the scientific workers in the scientific departments closely allied with practical medicine and surgery. Chemists, physiologists, bacteriologists, biologists, and pathologists have been brought into intimate association with the problems of the bedside. Many have for a long time felt that in our medical schools and hospitals

there has been too great a dissociation between the primaries and finals, between the workers and teachers in the scientific and practical subjects.

The war has uncovered this weakness. The necessities of war work have brought together in united effort all those engaged in any of the problems of disease and injury and their treatment. A community of interest has been established comparable to the organization found necessary among the combatants. It is in line with the close association of many departments under one management that has been evolved in the great financial, industrial, and transportation corporations. Each unit or department is suggestive, corrective, and stimulating to the other. Incomparably better results are obtained by the correlation of workers than is possible by dissociated effort.

I am of the opinion that the present war will mark epochs in our knowledge of the pathogenesis, pathology, signs, and treatment of many conditions including the two or three mentioned as illustration.

It must always be remembered that the medical work of the war has been performed by the civilian profession, and after the war they will doff their military dress and resume civilian practice enriched by their varied experiences. The lessons learned during the war will be applied after the war. Medicine has advanced—but at what a cost.

The closer working alliance established between the scientific and the practical workers, has proved so valuable and helpful, that one might venture the prophesy that after the war our physiologists, biologists, pathologists, and chemists will be invited to co-operate more actively than hitherto in our hospital work. That there are advantages to be gained by a closer affinity is established. It is quite possible, even probable, that one result will be a redistribution of the medical student's time. There are signs that our present system of medical education is not considered altogether satisfactory in some of its details.

Several very suggestive articles on this subject, have already appeared, and more are likely to follow. There are indications that the present medical curriculum may be modified in the comparatively near future. It is admitted that no mind (save that of the recent graduate) can, in a life time, master medicine in all its branches.

Our present system of education brings to our universities young men with an inferior mental equipment, that is a handicap

all through their college course. It should be possible for the embryo medical student to obtain in the later years of school life, adequate instruction in the preliminary scientific subjects. He would then come up to the universities with a better mind. He would be able to make more intelligent and profitable use of his time during the early years of his medical training. Then again, if I read the signs of the times correctly, graduate teaching will come to occupy a larger place in the education of a medical man, whether he is preparing for practical or scientific work.

Among the questions suggested by the experiences gained by our profession during the war, I believe one of the most important and far reaching will be the subject of medical education. What the more immediate changes may be is difficult to predict but that both undergraduate and graduate studies will be differentiated more in the future than in the past is highly probable. The same factory cannot turn out Ford and Rolls-Royce cars, nor can the same school turn out general practitioners, physiologists, biologists, and chemists with economy of time to all.

The undergraduate teaching best adapted to one intending to devote his life to preventive medicine, is not necessarily the best education for the man preparing for curative medicine.

The superstructure of the organization of war surgery consists of a board, composed of the Imperial consultants together with a representative from the C.A.M.C., one from the Australian A.M.C., and one from the New Zealand A.M.C. This board meets once a month in London. One or two of the British consultants in France came over and attended each meeting. In addition, twice a year a meeting of representatives of each of the medical services of the Allies takes place in France. At the meetings each country contributes its experience regarding the value of different therapeutic measures, that have been submitted to them at the previous meeting for report.

I may mention, as an example, the question as to the value of blood transfusion in war surgery—a subject by the way that has received material advancement from this city.

Great Britain, France, Belgium, Italy, Serbia, Portugal, through their representatives give their evidence regarding its value in specified conditions, methods of administration, etc. Such an opportunity bringing together a large amount of evidence on one subject in a short time, and of spreading the information over a wide area, only obtains during a great world war in which many nations are concerned.

War surgery, in its organization and in its practical application, may be far from perfect. I hope that it will be subjected to an intelligent and virile constructive criticism. This much I can say, and I am sure your President will concur, and that is, that so far as our observation goes every man in the Army Medical Services is trying to do his bit in a conscientious and self-sacrificing spirit. The Army Medical Services have probably had a freer hand in this war than in any previous army organization, and I think they are proving themselves worthy of the trust.

There is another question arising out of a study of the work by the Army Medical Services, and that is its influence on the personnel. Specialization has been a blessing to the soldier; it has narrowed the vision and perspective of the surgeon. After the war these men cannot occupy their whole time working in such a restricted field. Even in the greatest surgical centres there will not be a sufficient number of broken femurs—or nerve wounds, or mutilations of the face to absorb all the time and energy of a surgeon.

Re-education will be needed. Many men have worked in hospital wards doing routine dressings, some have been engaged as combatants, others in administrative work; very few have seen much of both medicine and surgery.

Before they return to their homes and resume practice, they should be afforded an opportunity of brushing up. The better class of men will seek such opportunities, others should be encouraged to find and embrace them.

EXOPHTHALMIC GOITRE

BY J. K. MCGREGOR, M.B.

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OUR present conception of hyperthyroidism is based on what is known of the physiology of the thyroid gland and its changes in disease. There are two known products of the glands: Colloid and its hormone, or the alpha iodine compound of Kendall. The gland's function is the determination of the amount of energy any cell in the body can produce upon stimulation either from within or without. An increase in the hormone will produce increased activity of the gland; increased energy of all cells and therefore increased metabolism.

A patient with hyperthyroidism is like a body on fire. Combustion is excessive. Clinically the patient has a good appetite, eats well, but loses in weight. The fire rises and falls as the hormone in the gland is released or withdrawn.

This leads to the work of Plummer along this line and because of its bearing on the differential diagnosis and its usefulness as an index of the patient's recovery it might be well to give a short description of the technic used.

A patient to be examined for metabolism is put at rest for fifteen minutes. A mask is tightly fitted over the face through which is inhaled outside air and from which leads a tube carrying the exhaled air to a gasometer. The percentage of oxygen in the air is a known quantity, 21 per cent. The volume of air exhaled in a given time, and the percentage of CO₂ therein is estimated. The amount of CO₂, when compared to the oxygen taken into the lungs, will give the amount consumed within the body, or, in other words, the amount of fuel consumed in the production. This, when figured with the square body surface (after Dubois table) is expressed in percentage of metabolism. The normal being zero, with an element of error of 5 per cent. either way, hyperthyroid cases usually run an average of plus 50 per cent. and may run

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as high as plus 140 per cent. The practical side of this test, insofar as it has gone, is, that the group of cases showing symptoms of tachycardia from psychic or other causes will not show an increase in metabolism. Adenomas of the thyroid which may have given toxic symptoms show a rapid return to normal metabolism when removed. This return to normal at an early date marks the difference between the thyrotoxic and the exophthalmic goitre. Ligated exophthalmic cases will gain twenty-five to thirty pounds in a few weeks, but the metabolism will not decrease with the gain in weight and the general improvement in the patient's condition. As an index of whether enough gland has been removed at the operation the test offers something tangible, whereas previous to this it has been pretty much a matter of conjecture.

The symptoms of exophthalmic goitre given in the order in which they usually make their appearance¹, are: Cerebral stimulation; vaso motor disturbances of the skin; tremor; mental irritability; tachycardia; loss of strength; cardiac insufficiency; exophthalmos; diarrhoea; vomiting; mental depression; jaundice.

The course of the disease may be represented by a curve. The curve rises gradually to its greatest height during the first year, and then gradually falls with intermittent exacerbations during the next three or four years. Some cases run an acute course, resulting in death in a few months. The gland itself may be but little enlarged, may be hard, nodular or soft and pulsating. Balfour points out that the throbbing of the superior thyroids is characteristic of the disease. The sex proportion is about three females to one male, and the disease is most common in the second, third, and fourth decade.

Confusion in diagnosis is probable with the thyrotoxic or non-hyperplastic type. This disease gives a history of the appearance of an enlargement of the thyroid at the age of twenty. No symptoms have arisen until the age of thirty-six, when cardio vascular degeneration, the result of the toxic condition, begins to make its appearance. These cases in the advanced stage give the highest operative mortality, running as high as 5 per cent. in expert hands. They offer no results from preliminary ligations. In the differentiation between exophthalmic goitre and tachycardia due to other causes, where possible, the metabolism test will be used. This should be of great use to military boards examining returned or discharged soldiers, as I believe this class of case has given rise to much uncertainty as to its classification.

The selection of time for surgical interference is of the utmost

importance. During the first year of the disease it is very doubtful whether anything but rest and medical treatment should be advised. It is equally true that early operation, before damage has been done to the heart and other organs, will give a lower mortality and a higher percentage of permanent cures than if the operation is undertaken late in the disease. The mental state of the patient is by far the best index of the safety of surgical procedure. When the patient is on the down curve is the time to select for one of the preliminary steps.

Ligation of one or both thyroids has done more than anything else to reduce the mortality in this disease. To this I think should be added Porter's injection of boiling water. Both on account of the marked improvement following either of these plans, and because an estimation of what the patient can stand, is thereby obtained, the removal of the gland should never be attempted as a primary surgical procedure. Porter's treatment is simple and may if necessary be done in the office. No anæsthetic is required. All that is necessary is a large metal syringe and a heavy pair of x-ray gloves. The gland is pushed up from behind by an assistant and the boiling water injected into one or both lobes, the quantity depending upon the size of the gland and whether a ligation is combined with the injection or not. Care should be exercised not to infiltrate the tissue outside the gland. Care should also be taken that the syringe is firmly fastened to its needle, thereby avoiding the chance of a disagreeable burn, which has happened to many operators, by the sudden separation at the junction of the needle and syringe. My personal experience, which has been eighteen cases in the last two years, without a mortality, either with the injection or in the subsequent removal of the gland, has led me to advocate this method as equally beneficial to ligation, and in my mind of less shock to the patient, thereby being appropriate to the more desperate cases.

The removal of the gland may be undertaken from ten days to several months after the preliminary treatment, depending on the reaction.

The operation itself should be done under a general anæsthetic with a preliminary dose of morphia. Judd² says that there is no contraindication for the use of ether anæsthesia, even in the desperate cases. Crile's method of preparation or "stealing" the gland, is of use in selected cases. It is important that all nervous patients, and those who have a badly damaged heart, should be generally etherized. In the experience of the Mayos' the opera-

tion carries less danger than when it is attempted under a local anæsthetic. Control of bleeding in the operation is one of the most essential points. Special attention should be paid to superficial vessels. If a part of the posterior capsule with a small amount of gland substance is left, irritation to the larynx is less and the convalescence is easier. The leaving of the lower lobes, by cutting directly through them with the scissors, avoids the danger of injury to the recurrent laryngeal nerve. It is advised that all cases should have the vocal cords examined previous to an operation, for, as has been pointed out, there may be already an injury to the nerve on one side. The amount of the gland removed should not be more than five-sixths of the total. This, however, can only be gauged by experiences.

We have used, before closing, Harrington's solution on a swab over all cut tissues. The operation is completed with a stab drain introduced below the incision, this being removed on the second day.

Post operative treatment consists of morphia administered liberally, ice pack to the præcordial region, and continuous saline per rectum. Absolute quietness should be insisted upon, and upon leaving the hospital the patient should lead a careful life for several months, free from influences which may call upon any reserve energy.

An increase in weight is noted at once with a gradual disappearance of other symptoms, exophthalmos being the last to remain.

Injury to the vocal cords has been a very frequent complication with us, but in every case a readjustment with recovery has taken place.

As to the results of surgical treatment of exophthalmic goitre, Balfour³ says that the patients' verdict should be taken, although actually no cure is made unless all the symptoms have entirely disappeared. If this is accepted 75 per cent. of cases will be cured or able to carry on their ordinary life duties; 20 per cent. will be improved, and 5 per cent. will show very little, if any, change.

My mortality has been one death in fifty-three cases that have come to operation. In this case no preliminary operation was done.

Any success we may have had in handling this disease, I believe is due, not so much to the operation as to the fact that cases coming to us have only been accepted on the understanding that they must put themselves absolutely under our care for the

next six months and that they will accept any line of treatment mapped out for them during that time.

In conclusion, I would say that if the confidence of the patient has been gained, and the surgeon shows both patience and good judgment in selecting the time of operation, the operative mortality should not be any higher for the average surgeon than it is in those clinics where the operation is a daily occurrence.

References:

1. PLUMMER.
2. JUDD.
3. BALFOUR—"Collected Papers," Mayo Clinic, 1915.

WAR has resulted in a serious depletion of our supply of radium. As a result of the reckless use of this material there is little available for surgery, which is generally acknowledged as the field in which radium can render the greatest service. Mesothorium, an element similar to radium, has been called into use. Unlike radium, which is the product of ores, mesothorium is extracted from a kind of sand. It is extremely like radium in character and effect. It differs mainly in its life. Radium reaches its full power in thirty days and in two thousand years that power would diminish only one half. Mesothorium, on the other hand, takes a year to gain its full strength, at which time it is as powerful as radium, but in five and one-half years its strength is almost gone. As the life of the average luminous watch is less than five and one-half years, mesothorium is a satisfactory substitute for radium for this purpose. The radium on a dial would really last for nearly two thousand years. It would not be recognizable, however, after a few years, as the zinc sulphid which is mixed with the radium to enable it to give forth its light, would gradually disappear. The radium desposits on worn out watches and instruments could be used again if a sufficient number of articles could be collected to warrant the expense of separating them.

ACTINOMYCOTIC INFECTION—WITH CASE REPORTS

BY A. I. McCALLA, M.B.

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THE whole subject of actinomycotic infections is shrouded in darkness and uncertainty. Recently, James Horner Wright of Boston has done extensive work on this subject, but his findings do not agree with the work of other writers in all particulars. In fact, there are differences of opinion on almost every point with the exception of the pathology of the disease.

I shall take up the subject under the usual heads:

1. Definition. 2. Historical. 3. *Ætiology*. 4. Pathology, general and specific. 5. Symptomatology. 6. Prognosis. 7. Treatment.

1. *Actinomycosis* may be defined as a subacute or chronic, local or generalized infection brought about by a specific micro-organism, the *actinomyces bovis*, and resulting in necrosis and suppuration with the production of much granulation and connective tissue.

2. *Historical*. The organism was first seen by Von Laugenbeck in 1845. It was later found by Ballingar in the ox. The botanist, Harz, gave it the name *actinomyces* or "ray fungus". In 1878, Israel reported cases in human beings, and gave cultural characteristics. Since 1880, much work has been done, particularly by James Horner Wright of Boston. His work has done much to clear up the preexisting confusion, but his findings are not accepted in all quarters.

3. *Ætiology*. The causative agent is the *actinomyces bovis*. Wright claims that the *actinomyces bovis* is a separate and distinct group, and should not be confused with the *leptothrix*, *claudothrix*, or *nocardia*; which he claims are entirely different, having widely varying cultural characteristics, a different habitat, and producing in the animal organisms, a characteristic type of disease. Foulerton, on the other hand, claims that all organisms

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belonging to the higher bacteria should be placed in a single genus-Streptothrix, Class Hypomycetes and states that streptothrix and actinomyces are synonymous terms. Most authorities, however, place the actinomyces in a distinct group, between the bacteria on the one hand, and the moulds and hypomycetes on the other. Two distinct types are described by early writers. Bostrom, in 1890, described an organism which grew best aerobically, on ordinary culture media, and at room temperature. He noted its frequent occurrence on fragments of grain and on grass; and this led to the finding of similar threadlike, branching organisms scattered widely in the outer world. These do not lead, on introduction into the animal body, to true actinomycosis, and should not be regarded as the ætiological factor in that disease. Wolf and Israel, in 1891, described an organism isolated from human cases. It grew best in the absence of oxygen, and on special media, and not at all at room temperature. Injection of this organism into animals produced tumours in the peritoneal cavity, histologically resembling true actinomycosis, and from which the micro-organism could be isolated. Most subsequent writers agree with the findings of Wolf and Israel, and claim this as the true actinomyces bovis, and the only organism that should be so described. In the pus from lesions caused by actinomyces bovis, the organism exists in the form of small whitish and yellowish granules, measuring up to one or two millimetres. These are the so-called sulphur granules. These granules are composed of a net-work of branching filaments, arranged in a radial manner. Often, about the terminal filaments, are found hyaline, clublike bodies, formed by the terminal filaments becoming surrounded by a sheath of hyaline material. These clubs have been regarded by various writers as (1) Organs of fructification; (2) Degeneration products; and (3) As a protective device, allowing the actinomyces to live under conditions that otherwise would prove fatal.

The clubs are not produced with any degree of constancy. Mallory claims that they are very rarely found in human cases; and all observers agree that they are much more common in animal lesions than in human forms. In the preparations that I have made I have never been able to find any clubs. In smears from the pus from infected cases stained by Gram's method, the organism appears as long or short branching filaments, having irregular staining areas along their length. At times, they are very short and resemble cocci. They are Gram positive, and the clubs, when present, are Gram negative. It is not necessary to find the clubs to make a diagnosis of actinomycosis.

There has been a great deal of confusion regarding the mode of infection, and the portal of entry of the actinomyces, resulting from the conflicting characters of the two types described by the early writers. The organism described by Bostrom had its habitat largely in the outer world, on grain, grasses, etc., and the infection was thought to gain entrance to the body through these substances. In many cases also there was a history of eating uncooked grain. This idea is erroneous, because actinomyces bovis does, viz.: not have the histological characteristics of this saprophytic group; luxuriant growth at room temperature on all ordinary media, but rather has cultural characteristics suggesting that its habitat is not outside the animal body. It is claimed that the organism probably exists normally in the mouth and alimentary tract, where it is not recognized on account of its morphology being different from that which it assumes in the lesions. It gains entrance through carious teeth, breaks in the mucosa of the mouth caused by foreign bodies, and possibly through preceding acute infection. The fact that some of the cases give a history of an acute onset, a period of quiescence, followed by actinomycotic infection, would lend colour to this view.

The infection is not contagious. It is exceedingly difficult to produce the disease by injecting the infected pus into animals; and on account of its low direct virulence, it would seem that a greatly lowered resistance or a natural susceptibility, or both, must be present. It is said to occur more frequently in men than in women; more often in the cities than in the country, though this is not true of many cases.

4. *Pathology.* The changes produced in the animal organism by the actinomyces bovis are destruction of tissue with suppuration, and the formation of large masses of granulation and connective tissue. In its spread, it does not follow the fibrous and muscular planes of the body: but invades everything in its path; in this way resembling a malignant growth. The amount of connective tissue found is often enormous, and far exceeds the size of the colonies of the micro-organisms. Macallum says that giant cells are not found, nevertheless they are occasionally present

N.B.—It is interesting in this connection to note that the first intimation of the disease in one case, occurring in the appendix, was the finding of giant cells in the mucosa. The appendicectomy was performed during an acute attack, and the giant cells were discovered during a routine examination of the sections.

Healing may occur at one point when the disease is spreading at another. Irregular scar formation results. The disease spreads either by direct extension or by metastasis; through the invasion of the blood-vessels, and the breaking off of masses of the mycelium. Extension by the lymphatics, or involvement of the lymph-glands is said to be exceedingly rare, if indeed, it occurs at all. Secondary infection by the pus-producing cocci is exceedingly common, some authors stating that the actinomyces alone are unable to produce pus. There is often glandular enlargement due to the suppurative processes, but the glands are never involved by the growth of the organism. If, however, the glands should lie in the line of growth if one may use such an expression, they would be involved the same as the other tissues of the body. Given an organism producing the effects described, it is not hard to forecast the changes produced in various parts of the body.

About sixty per cent. of all cases occur in connection with the mouth and pharyngeal cavities. Infection probably occurs, in most cases, through carious teeth, and the infection may spread by direct extension, to the bones of the jaw or the face. During the spread, the soft parts are involved, and pus cavities are formed, which, breaking on the surfaces produce sinuses. Large amounts of connective tissue are thrown out, and the result is a mass of granulation and connective tissue riddled with pus pockets and sinuses.

The bones of the skull and the brain may be involved. One case of primary actinomycosis of the brain has been described. Extending downward, the sides of the neck are involved in the same sort of processes.

Fifteen per cent. of cases occur in and about the thorax. Abscess and cavity formation are the rule. The disease may spread to the pleura, and an accumulation of fluid be produced in the pleural cavity. The infection may extend through the chest wall, producing sinuses discharging on the surface. The mediastinum and the heart may be involved in the destructive process.

Abdominal actinomycosis produces about twenty per cent. of all cases. The pathology is the same here as elsewhere. Beginning in the mucosa, usually of the cæcum or the appendix, the disease spreads through the wall of the gut involved, advances rapidly through and between the coils of bowel, forming masses of granulation tissue, and later connective tissue. As the condition progresses central necrosis of the masses is produced, resulting in

abscess cavities. Eventually, having worked its way through the belly wall, the abscesses rupture on the surface, forming discharging sinuses and fæcal fistulæ. If the mass is recognized early, and an operation performed, much connective tissue is encountered. If the usual procedure is followed of ordinary drainage, the discharge continues, and a sinus remains which refuses to close.

If the whole mass has been dissected out, and the wound closed, as sometimes happens in early cases, after a short time, pus forms, the wound reopens, and a chronic discharging sinus develops. Any of the other organs of the abdominal cavity may be involved, and the process is the same in each one. Most cases originate in the gut at some point.

The few remaining cases occur as primary actinomycosis of the skin. It is a very rare disease. Skin is attacked secondarily to involvement of the muscles, bones and deeper structures. The disease in the skin is characterized, here as elsewhere, by the formation of nodular masses in the deeper layers. This extends out to the surface with the discharge of pus containing the micro-organisms. The disease spreads by continuity, sinuses develop, and much connective tissue is thrown out. The condition is progressive, and exceedingly chronic. The lymph glands are not involved.

5. *Symptomatology.* There is no definite symptomatology, but we find symptoms resulting from the tumour formation and the suppuration.

In abdominal cases, often the first thing to call attention to the disease is the presence of a mass. At times, it begins as an acute appendicitis; but we have to remember that probably the acute attack is not caused by the actinomyces, but it simply produces a suitable soil for the subsequent growth of the organism.

About the head the disease may occur as an acute illness, with swelling, pain, and rise of temperature; but more often a mass slowly develops with very little discomfort, except that due to the tumour itself.

In the chest, you have the symptoms of destruction of tissue, with abscess formation. As long as it is confined to the lungs themselves, very few symptoms develop. If a bronchus is opened, you have cough with expectoration in which the organism may be found. When the pleura is involved, pain follows.

As the disease progresses, we have rise of temperature, with loss of weight and weakness, and symptomatology suggesting

tuberculosis; but no tubercle bacilli are found in the sputum. Actinomycosis usually affects the base; tuberculosis, the apex.

The clinical findings of empyema may develop with involvement of the pleura. Puncture is apt to be dry, no pus being found or perhaps in very small quantities, examination of which may reveal the micro-organism.

In cases where multiple metastatic foci of infection have been formed, you have virtually a pyæmia with all the symptoms of that disease.

The tumours growing in the brain, mediastinum, side of the neck, etc., will give rise to symptoms resulting from pressure.

6. *Prognosis.* This depends upon the site and extent of the lesion. In those cases involving the head and neck, probably seventy-five per cent. recover. In the thoracic type, the outlook is exceedingly bad. There are series of cases reported without a recovery. Other writers claim a recovery of one or two in a series, but it is doubtful if these are permanent. Wright states that there are not more than a half-dozen cases of recovery reported in the literature, and that most of these are doubtful.

In the abdominal type, the prognosis is bad; but better than in the thoracic form of the disease. It is better when the retro-peritoneal space has not been involved; the disease being confined to the coils of intestine or the anterior abdominal wall.

The ideal situation as regards prognosis in any case, would be a lesion that could be removed fairly completely, surgically, followed by appropriate medical treatment.

Recurrences are not rare, even after apparent cure. Two years should elapse before a cure is said to be effected.

7. *Treatment.* This resolves itself in three forms—surgical, medical, and treatment by radiation.

(1) *Surgical.* Abscesses should be drained, sinuses curetted and isolated foci removed, where possible, as in the early actinomycosis of the appendix.

(2) *Medical.* In all cases, whether or not possible to begin with surgical procedure, potassium iodide should be administered in large doses, extending over long periods of time.

(3) *Radiation.* Combined with the surgical and the medical management, the Roentgen rays and radium are claimed to have influenced a beneficial effect in the limitation and cure of the disease.

Case 1. M. H., boy, aged twelve, child of a farmer, pre-

sented himself on June 18th, 1917, with a swelling on the right side of the face; was suffering no pain. He gave the following history.:

About one year ago, he first noticed a lump on the right side of face. It developed suddenly after a blow, and lasted one week, disappearing at the end of that time without treatment. After a couple of weeks, it reappeared, and has remained since.

About January 1st, 1918, was operated on, and there has been a more or less constant discharge of pus ever since.

Examination showed a hard mass on the right side of the face, apparently involving the lower jaw on that side. It was firmly adherent and was discharging pus. After repeated examinations, extending over some days, the actinomycoses were found in preparation stained by Gram's method. No clubs were found. The patient was put on potassium iodide gr. x. t.i.d. Reported again on January 16th, at which time he was taking grs. xxv. t.i.d. There were no areas of fluctuation, and no discharge of pus. On March 20th, mass was smaller, but a soft spot had appeared on the surface, and looked as if it were about to rupture. Boy has been lost track of since.

Case 2. H. S. P., aged twenty-eight, male, farmer. On August 28th, 1913, he gave the following history:

Three days before, throat became sore; he had difficulty in swallowing, and he suffered from headache and malaise. His pulse was 100, and temperature 100.2°. He appeared to be acutely ill. Examination showed a soft swelling on the right side, below the angle of the jaw. The throat looked cedematous, but there was no bulging on either side. Tonsils were not swollen. The glands on the right side of the neck were swollen.

On September 11th, the mass was incised. The pus showed sulphur granules in the gross. Stained specimen showed mycelium but no clubs. He was put on potassium iodide grs. x. t.i.d., and later the potassium iodide was increased to grs. xx. t.i.d. An abscess formed under the skin, and there was considerable swelling along the side of the neck, and the right side of the face. On September 19th, the abscess was opened in front of the ear. It was deeply seated, and contained a good deal of pus. On October 17th, no pus discharging. There was a small salivary fistula from the parotid. The patient felt well. He had been taking potassium iodide grs. xxx. t.i.d. for three weeks.

Case 3. F. T., farmer. Presented himself on November 30th, 1913. Was complaining of having noticed for four or five days, a lump under the left lower jaw. It was tender on pressure, but not painful. The throat was clear, and the teeth in good condition. December 4th, incised the mass. No pus found. Hard connective tissue. December 10th. Fluctuating mass in the midline of the neck. Next day a midline incision was made, and three ounces of stinking pus were obtained. Mycelium was found in stained preparations. Much bacterial contamination was also present. He was put on potassium iodide in increasing doses.

January 29th, 1914. Has taken the potassium iodide regularly, and has had three exposures to x-ray. The sinuses are healed.

Case 4. A. E. M. S., aged sixteen, boy. On October 9th, 1916, gave the following history:

Had an operation for appendicitis in April, 1915. Appendix was removed, and the wound healed in ten days. Two months later, the wound opened, and continued to discharge until the last of October. Had an operation in November, and the wound has been discharging ever since. Has only occasional pain. Boy appears thin and pale, and has lost twenty-one pounds. Urine showed a trace of albumen, but nothing of note microscopically. Blood showed reds 3,400,000, hæmoglobin 60 per cent, white blood corpuscles 11,000, polymorphs, 79 per cent., lymphocytes 18 per cent., endothelial cells 3 per cent. In smears, the reds were irregular in size and shape, and pale in colour. Barium meal showed nothing of note. Smears of pus showed mycelium of actinomyces, but no clubs.

Case 5. C. L., male, aged thirty-one. May 19th, 1918, Patient came complaining of a swelling just below the chin. Had noticed the mass for the last three weeks. Tumour was indurated and hard, but gave some fluctuation. Man appeared healthy. Temperature 98°, pulse 80. Physical examination was negative.

On May 23rd, the mass was incised under ether anæsthesia. Moderate amount of pus was evacuated. Sulphur granules were present. Smears showed mycelii of actinomyces. No clubs. He was put on gradually increasing doses of potassium iodide.

July 21st, has been taking 120 grs. of potassium iodide daily. More than this produces nausea. The mass is much smaller and there is no pus discharging.

Case 6. V. O. C., farmer, age forty-two. Presented himself on August 29th, 1914, giving the following history: On the morning of August 27th, 1914, he woke up with pain all over the abdomen. There was no vomiting. On the afternoon of August 28th, the pain became localized to the lower abdomen and was severe. There was not much pain on the 29th, but when he was examined on that evening, a mass the size of a large hen's egg could be felt in right lower quadrant. His pulse was 104, temperature 103°, at 8 p.m. As there was some tenderness throughout abdomen it was considered wisest to wait for further localization.

On September 5th, an incision was made and the abscess opened and drained; unfortunately no microscopic examination of the pus was made.

He was kept in hospital for a time and allowed to go home while the sinus was still discharging with instructions to return later for removal of the appendix. On December 9th, he returned with the sinus still discharging a little. A probe passed one and three-quarter inches.

On December 12th, 1914, an incision was made and the appendix amputated and the sinus dissected out. There was a good deal of thickening around the sinus and a good-sized piece of rectus muscle was dissected out in order to get away the thickened tissue. The wound was closed in layers. For a few days he ran an ordinary afebrile course, but on December 18th, as he had a rise of temperature, the wound was examined and as it looked swollen at one point, a stitch was removed and the lips of the wound separated; a small amount of blood stained pus was evacuated and a drain inserted. This gradually filled and he was allowed to go home about the 18th or 20th of January with his wound apparently quite healed.

On February 2nd, 1915, he returned and reported that on the day before the wound had discharged a quantity of pus. On examination there was an opening the size of a pea discharging thin pus.

On February 18th, the sinus was curetted and packed with iodoform gauze. The discharge continued and in March a specimen of pus was examined. The mycelii of *actinomyces bovis* was found. He was put on moderate doses of potassium iodide. On different occasions afterwards specimens of pus were examined and the mycelii found. No clubs seen at any time.

I may say that the microscopic examination made at the

time the appendix was removed, gives only the report—chronic inflammation with *giant cells* in the tissues surrounding the sinus.

June 9th, 1915. Has had potassium iodide in increasing doses, taking up to 110 grains per day.

Mass in and under the rectus, feels about one half to one third of what it did a month ago. Discharge is less. Sinus admits probe for one inch.

May 3rd, 1918. Completely healed since August 30th, 1917. Ventral hernia in wound.

RHEUMATISM and infections of the heart, kidneys and intestines are often closely associated with the condition of the teeth. It has been learned that these affections were most common in the Austrian and Italian armies, in which dental science was least advanced. No army had any superiority over the Canadian army with respect to the health of the men's teeth. Dr. C. H. Mayo says that "a crowned tooth is not a crown of glory, and may cover a multitude of sins." The really dangerous tooth is the dead tooth, the tooth from which the nerve has been removed. This tooth cannot ache, nor form an abscess, but there is always the possibility of germs remaining in it and laying the foundation of some illness that may incapacitate or cause the death of the victim without previous suspicion as to the cause of the trouble. Tonsillitis, earache, inflammation of the nasal cavities, deafness, eczema, rheumatism, blood-poisoning, are a few of the ills that modern science has traced to teeth that have never ached but have harboured germs.

THE RECENT EPIDEMIC OF PNEUMONIA— BEDSIDE FINDINGS AND SOME INFERENCES

BY GEORGE S. YOUNG, B.A., M.B.

Toronto

IF one could forget the word influenza there would be left no resemblance between the epidemic pneumonia of the last few months and that associated with other epidemics during the last thirty years. Looking over the literature of 1889 and 1890 one finds such statements as these: "The mortality seems greatest in those having old chronic ailments." "Broncho-pneumonia is more frequent than lobar pneumonia, but differs from the ordinary lobular pneumonia in that the exudate is richer in fibrin. It does not affect the lower and posterior parts of the lungs, but the upper and anterior parts." "There have been three times as many cases reported as last year, but the percentage of mortality has not increased." These statements certainly do not apply to the present epidemic with its mortality of upwards of half a million people in the United States alone, and these people, not old, but young and vigorous. A more significant fact is that in the descriptions written in the journals of that time, there is no reference to certain striking clinical features so noticeable in the cases of to-day.

The epidemic pneumonia of the last three months has varied in severity, from cases so mild that the diagnosis might be open to question, to those so rapidly fatal that there was scarcely sufficient time for the physical signs of consolidation to appear. The more serious cases, however, presented characteristics which make the disease a clearly defined entity differing from other epidemics described before. Of these, none is more remarkable than the absence of nature's usual effort to compensate for impaired function and to combat disease. In the presence of a pneumonic infection one would expect that the respiratory rate would be markedly increased to make up for the lung area out of

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commission. The pulse should rise to meet the necessities of the pulmonary circulation. One would look for an early and vigorous leukocytosis. This is precisely what we found in the pneumonia cases of other years. But in this epidemic it was common to find a comparatively slow pulse and respiration, the latter often being shallow, though painless. Even the temperature would sometimes drop to nearly normal on the invasion of a new area of lung. It is interesting to note that the temperature on the average was lower throughout the course of the disease than in lobar pneumonia.

Most of the serious cases, and many of the milder cases, could be recognized at once by the peculiar colour of the lips and tongue. Writers everywhere have endeavoured to describe this strange cyanosis, and such phrases as "the purple death", "lilac tint," "heliotrope shade," appear in the literature. This was associated with a dusky flush or a gray pallor according to the severity of the case. The cyanosis cannot be explained by cardio-vascular failure for it might be present with good heart sounds, an undilated heart and adequate systolic and diastolic blood pressure. Nor is it necessarily the result of the pulmonary involvement, since it was sometimes seen when physical signs of respiratory trouble were not apparent. A patient without cough showed this peculiar colour for two days before a single abnormal sign could be detected in the chest. The associated emphysema has been suggested as a cause, but we are not familiar with such a colour even in advanced cases of this kind under other circumstances. The only adequate explanation that can be given is, that the infection produces a rapid and profound alteration of the blood, such for example as may be found in carbon monoxide poisoning. In a few cases reported by Synott and Clark spectroscopic examination failed to reveal the presence of methæmoglobin. For the present it can only be said that the cyanosis is due to some unknown change in the red blood cells.

Writers all over the world have called attention to the hæmorrhagic tendency shown in this epidemic. Keeton and Cushman, in a report of about one thousand cases, place this feature as second in point of constancy, toxæmia alone being put before it. Epistaxis, bleeding gums, hæmoptysis, hæmatemesis, hæmaturia, petechial spots and hæmorrhage into the rectus muscle, are all mentioned. Women menstruated during the first two or three days of illness. Pregnant women usually aborted.

Probably most of us have been struck with the hyper-reson-

ance of the uninvolved portion of the chest in these cases. Even over areas showing bronchial breathing there was not always the dullness that one might expect. No doubt this was due to emphysematous lung lying between patches of consolidation. Occasionally a pneumothorax or subcutaneous emphysema would call attention to the intense pulmonary emphysema. This has not been as frequent here as in some parts of the States, where it was so common that in one recent report the epidemic was referred to as bronchitic emphysema.

Although albuminuria is probably more common in acute infections than we realize, it seems to me that in these cases the toxins affected the kidneys particularly. It was present in a large number of our cases in Toronto and has been noted elsewhere as occurring in about fifty per cent. of the cases.

The onset of the so-called influenza followed a short incubation period, not more than forty-eight hours. A patient became ill here in Toronto at the beginning of the epidemic and went home to his people in the country where at that time there were no cases. He arrived on a Friday night. The following Monday morning three more in the home were sick, and two or three days later the nurse who had come on the scene was also in bed. Three cases of pneumonia occurred, one of which was fatal. It was often difficult to say when the pneumonic process had begun. Some showed signs at the very beginning of the illness. A continuation of the temperature on the fourth day or a rise following a drop on the third day, even without physical signs, aroused suspicion of serious respiratory trouble and the suspicion was generally well founded.

The physical examination was often negative at first. Impairment of resonance was frequently masked by the accompanying emphysema. The breath sounds might be diminished over involved areas, but more important was the occurrence of fine râles at the end of inspiration. These were most often heard around the angle of the scapula, in any case generally over the lower half of the lung. The râles might not be brought out until the patient was asked to take a long quick breath or a deep breath with the mouth open. In examining the back it is worth while to use the stethoscope with the patient lying first on one side and then on the other. Râles may be found over the side nearer the mattress owing to the slight compression of the lung, whereas reversing the position may obliterate them. Of course these fine râles would have no significance unless they were persistent. We are all

familiar with the crepitations which appear and disappear in the first one or two deep breaths in patients with normal lungs who have been lying quiet for a time.

In many cases during the epidemic the physical signs never passed beyond this point, viz. fine localized râles, diminution of breath sounds with or without impairment of resonance. These might persist for a week or ten days, the patient well enough to complain about having to stay in bed. I am of the opinion that these were true cases of broncho-pneumonia with very limited involvement of the parenchyma of the lung. It is difficult to conceive of a bronchiolitis, which these signs at the very least indicated, without involvement of the alveoli in which these bronchioles terminated. This, however, is a matter of individual interpretation. The important point to be noted is that these mild cases, whatever we may call them, were unquestionably due to the same infection which produced the indisputable cases of pneumonia. How many of the so-called influenza cases showed these milder signs? The general practitioner alone could give an answer. From a review of the literature, and my own limited experience, I think it is safe to say that pulmonary or bronchiolar signs occurred in at least fifty per cent. of the cases of influenza, whether the more serious pneumonia developed or not. The significance of this will be referred to later on.

Following these early signs the next to appear in progressive cases was generally a change in the vocal resonance, i.e., an increasing clearness in the voice sounds, and as this could only be due to increased conductivity of the lung through consolidation, the diagnosis of pneumonia could be made positively, even though bronchial breathing was not yet definite. The advance of physical signs from there on is familiar enough. Sometimes several patches showing these signs would shortly become one large area with the physical signs of lobar pneumonia, but not often limited by the fissures of the lung. Practically always there were signs in both lungs showing various stages of development of the process, and generally the storm centre was around the angle of the scapula. Often there was little or no sign of bronchitis until after the finer tubes gave evidence of involvement. Clinically the coarser bronchitis often seemed secondary to the bronchiolitis, and it was difficult to picture the process as one of extension down the bronchial tree. One felt like regarding it as a blood borne infection with a selective activity for the pulmonary terminals.

Pleurisy, as indicated by a friction sound, was conspicuously

infrequent. In fact the occurrence of a rub seemed to point to a severe and wide spread involvement. Resolution was extraordinarily slow. One patient seriously ill had well marked signs of consolidation at the end of six weeks yet eventually made a good recovery.

It was rather surprising to find so little evidence of cardiac weakness. Even in critical cases the muscular quality of the first sound might be good and the second pulmonic sound well accentuated. The right heart was seldom enlarged to percussion. The vascular tone was low. Gibson's rule did not always hold good. In one case, for several days after the onset, the systolic blood pressure was never over ninety and yet the patient was not seriously ill and made a good recovery.

Active delirium was not so frequent as somnolence or stupor from which the patient could be aroused to answer questions rationally. It was not uncommon for a patient to express himself as feeling first rate within a few hours of death.

Now and again an atypical case would convey a hint of some of the other infections with which we are familiar. For example a fiery red pharynx might suggest a streptococcal infection, or rarely herpes labialis, the facial sign of the pneumococcus, might be present. A complicating empyema might be the work of the staphylococcus. These, however, were superimposed on the characteristic picture. They leave unchanged the conclusion that the present epidemic pneumonia is a clear cut, well-defined disease, apparently unknown before,* characterized by certain fairly constant features. These are the feebleness of nature's defensive reaction, the profound alteration of the blood, a marked hæmorrhagic tendency, an emphysema of an unusual character, early renal irritation, and a bilateral involvement of the lungs.

There is much to suggest that the micro-organism which initiates the so-called influenza, is also responsible for the pneumonia which so follows. In several reports of the epidemic the incidence of pneumonia has been given as about thirty per cent. of the total number of cases. If we add to these the cases showing only a few localized but persistent fine râles, then pulmonary involvement becomes a manifestation rather than a complication of the original infection. It is true that in the pneumonia cases

*Dr. J. H. Elliott has since called my attention to a book by Dr. Peabody published in 1848, describing the influenza epidemic of the preceding year. His description of the associated pneumonias corresponds fairly well with the findings during the present epidemic.

there have been found in the sputum, blood, and lungs, the organisms which are known to be associated with this disease, but sometimes one germ is present, sometimes another; and yet clinically all the cases are essentially alike. The pathologists confirm this. "The findings in the lungs are quite unique and strikingly similar, irrespective of the species of micro-organism present." (E. C. Rosenow.)

It would seem that there must be one single causative agent responsible for the common features of all the cases. If this is the bacillus influenzae it has acquired a new selective activity. Its ancestors would not recognize it. To the clinician, at any rate, the conclusion is irresistible, that the micro-organism is not demonstrable by the present cultural methods. Meanwhile there is an opportunity for the study of the outstanding characteristic of the epidemic, viz., the remarkable blood dyscrasia, which is apt to be forgotten in the investigation of the pneumonic process which accompanies it.

THOUGH written four hundred years ago, Leonardo da Vinci's book on anatomy has only recently been published, and surgeons are only now discovering the marvels it contains. Professor William Wright lately lectured upon the work in London, England. He pointed out that when it was written the circulation of the blood, osmosis, oxygen, and the microscope were all unknown. All doctors believed that the arteries were full of free air and that the blood was aerated in the heart. The interior arrangement of the heart was also misunderstood. Leonardo denied that air entered the heart, and wrote that the blood was "refreshed" in the lungs; he described accurately the anatomy of the heart and large blood vessels, and the action of the muscles of the chest and abdomen in respiration.

TERMINOLOGY OF MILITARY REPORTS

BY J. A. HISLOP, MAJOR, C.A.M.C.

Edmonton

I WISH to command your consideration for just a few minutes to present an old subject from a new angle.

Every professional man in practice is familiar, and in many cases proficient, in the matter of examining for life insurance. A medical man does not know this branch of work by instinct but by steady practice and making an honest effort to gain proficiency in the work. When we start practice we are inclined to think the form contains a lot of silly questions, some of us never get past this stage.

Again there are the examinations for compensation for injuries, as accident insurance. This form is often worded in such a way as to irritate any examiner, and probably is intended to do so; as few of us have any record of receiving any fee for satisfactory service and the effort appears to be directed toward evading payment. Since the Compensation Act came into force it is becoming more common for those hiring men to have them submit to a medical examination, so as to have on record their condition on entering service. This is not strange, but the marvel is, it was not done long ago, especially in occupations paid by the day. As a matter of fact this examination was in most cases carried out by the foreman and the success of the contractor often depended upon the foreman's diagnostic powers. However, this haphazard state of affairs is passing and the time is gradually coming when the medical man will be called, as a matter of routine, to pass upon all men for whom a liability is assumed, or from whom a definite physical performance is expected.

The military have taken this stand and the man is examined on enlistment and on discharge, and any disabilities, the result of service, are tabulated, and in a very modest way paid for.

When our army mobilized, the work of examining had, in the very nature of the case, to be performed by civilians, as the regimental medical officers were too few for the task. It at once became obvious that the profession were sizing men up from an in-

surance standpoint and not from an occupational one. This was the cause of much hardship in men being induced to leave their occupations and report for enlistment, only to be rejected later for obvious defects. However, that is past, and the time will shortly be here when our men will again be entering civilian life and again be under the care of the civilian practitioner, and it is to this time I wish particularly to call for your co-operation, and to ask you to exert yourselves to become more efficient and see that we, by a united effort in the last half of the series, raise the score which, up to the present, is against us.

The government in this case is the insurance company and the form you will have to deal with is known as "The Medical History of an Invalid". You will be furnished with a complete history of the disabling conditions, i.e., not an anatomical description of the cases, but a statement of his loss of functions.

The government acts in a paternal capacity and is anxious that the case be fully stated. The remuneration you will receive for all this will bear a remarkable resemblance to that paid by industrial companies, but I am sure you will feel compensated when you learn what the pensioner gets for his sacrifice and will feel gratified that you are able and are permitted to do your part.

We find there is a persistent tendency on the part of the examiner to give a detailed anatomical description of the injury, instead of stating the functional disability, and as this latter is essential to arriving at a basis of settlement there is great confusion and often delay. As the government policy is to have the injured man examined every six or twelve months it is necessary that the description and opinion coincide with those already recorded, otherwise the case is thrown out on account of conflicting reports. This is very apt to occur on account of the great lack of a common language or nomenclature among the profession, as one refers to the fore finger as the first finger, another to the little finger as the fifth, etc. Again some consider the hand in straight line with the forearm as being in full extension, while the next man assumes hyper-extension and full extension as synonymous. This leads to confusion, especially when the description states the hand or fingers can be moved through, say thirty degrees from a point which is so indefinitely defined. Again we have no accepted standard in describing the power of the grasp; what would be normal in one would not be a basis of description for the next. Also "dyspnoea on exertion", is it slight, moderate or extreme in degree and is it produced by slight, moderate or extreme exertion.

You will see we have no commonly accepted physical exercise to quote as a standard, some state climbing two flights of stairs, another, physical training, as touching the toes six times, leaving out the time in which this exercise was performed. There is a great diversity of opinion as to what is a correct angle for an ankylosed joint as, say the elbow. Also the term "rheumatism" is too often and too vaguely employed, and there is a tendency to forget to mention the effect of extremes of temperature, following impairment of circulation, locomotion, or sensation.

If possible use the official nomenclature, a copy of which can be obtained on application. Avoid vague terms. If more than one disability exists, number each and give each a separate consideration. Describe all abnormalities and state manner in which they interfere with earning capacity. When other systems are normal, say so without description. Give objective symptoms rather than the man's complaints. In most cases the subjective symptoms can be made objective by a little care on the part of the examiner. The more clearly and precisely the picture is drawn the more readily the case can be finally dealt with. Give the source of all information other than your own, and in estimating the incapacity take no consideration of his present or past occupation, nor his age or income. It is his incapacity in the general labour market for unskilled labour that counts. This is probably a little vague and some prefer to estimate it from the number of occupations his disability would exclude him. As for instance, a man who had a shocking facial deformity with probably very slight loss of function, as say the loss of the nose, would to a great extent be excluded from any occupation which would require his meeting the public.

In an effort to arrive at a standard basis of settlement the government compiled a list of disabilities and submitted it to the different casualty companies asking them to state the extent of disability in percentage. The result shows a great diversity of opinions, in many instances too wide a gap. This indicates it is high time we, as a body, were giving the matter our earnest attention, especially as it is reasonable to assume the casualty companies will be forced to accept the standard agreed upon and the government is very anxious to get the matter settled definitely for once and all. I would therefore urge you gentlemen to take the subject up seriously and become posted, so as to aid us in the immense task of adjusting the claims of those who have suffered through accident at home or on service abroad.

INDUCTION OF LABOUR

BY F. W. GERSHAW, M.D., C.M.

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IN this brief paper I wish to discuss some points which arise in considering the question of induction of labour at maturity or about that time.

With habitual death of the foetus in the last weeks of pregnancy, induction shortly before the date at which the foetus usually dies (if syphilis is not the cause) often proves satisfactory. At present we cannot tell accurately enough when the foetus is in danger and trust to arriving at the date by previous experience.

In acute febrile diseases this operation is very seldom indicated. It would probably save some children, but the maternal mortality would be increased. If the foetus is dead in utero the operation is generally advisable, especially if there is any evidence of septic absorption, which will be extremely rare.

In case of a viable child should labour be induced in the interest of the child when the mother is dying? It is, of course, extremely trying on the operator's feelings to operate on a dying woman, but if it is clearly established that the mother's condition is hopeless and the child is living, it would be the duty of the doctor to empty the uterus (perhaps by Cæsarean section) before, rather than after the mother dies.

With chronic Bright's disease or cases of toxæmia with threatened eclampsia one should interfere, when in spite of treatment, pronounced symptoms, such as severe headaches, disturbances of vision, progressive diminution of quantity of urine, and in the output of urea, are present. In eclampsia the uterus should be emptied, usually by Cæsarean section, if the symptoms continue after the ordinary medical treatment has been given a trial. In cases where a large amount of albumen persists for a long time labour should be induced when the child is viable, as there is great danger of chronic cirrhosis of the kidney being established. Icterus calls for the induction of labour. In case of valvular disease of the heart the condition is different as there is great danger of

cardiac failure during or after parturition. Therefore most writers are very loathe to induce labour unless forced to do so by the patient becoming steadily worse in spite of treatment.

The individual cases must be studied in cases of tuberculosis, leukaemia, pernicious anaemia, Grave's disease, and chorea. With hydramnis interference with pregnancy is often indicated. I recently induced labour by rupturing the membranes in a patient with this trouble whose abdominal measurement reached sixty-four inches. The mother made a good recovery. It was a twin pregnancy and each child had a goitre. They seemed vigorous at first but both died in a few days. A very small opening was made in the membranes so that the many gallons of water escaped slowly. In cases of contracted pelvis where the conjugate vera is less than three inches, Cæsarean section will be required. Where the measurement is from three and one quarter to three and one-half inches induction of labour in the thirty-five or thirty-sixth week would seem to be most desirable. When the conjugate is over three and one-half inches, spontaneous delivery takes place in 65 per cent. of cases. Forceps and occasionally pubiotomy is the most suitable treatment for the remaining 35 per cent. of cases.

Most operators who employ induction of labour in contracted pelvis are disinclined to perform the operation in primagravida. They prefer that the first labour should be a trial labour and later labours induced if special difficulties were met in the first. Spontaneous delivery is more likely to take place in twin pregnancies on account of the smaller size of the babies.

It is the adaptability of the foetal head to the maternal pelvis which makes normal birth possible, therefore it is important to know the size and the maturity of foetus in utero. Most authors test the relative size in the thirty-sixth or thirty-seventh week by forcing the head down into the pelvis brim. If it is found to be too large at that time, labour is induced, if not, the patient is left for another fortnight. Because of the forcible manipulation required I have never had the courage to give this method a satisfactory trial.

Several other ways have lately been devised for measuring the size of the foetus. In the Perret method the biparietal diameter of the foetal head is measured. This can only be done when the head is freely floating above the symphysis, and as soon as the head enters the birth canal the method is not applicable.

In the McDonald method the distance is measured with a tape line from the symphysis pubis to the uppermost point of the fundus.

This seems rather uncertain as in the later months of pregnancy the vertex may be much below the symphysis.

The Ahlfeld method appears to be more valuable. This method is based upon the fact that the foetus at maturity is fifty centimetres, or twenty inches in length. Reed, of Chicago, has recently emphasized that the length of the foetus rather than the weight is the best index for determining the maturity. Ahlfeld pointed out that the true length of the child is twice the measurement of the distance from the vertex to the buttocks of the child in the position normally assumed in utero. This he determined by measuring externally with a pelvimeter from the upper border of the symphysis to the uppermost part of the buttocks as palpated through the abdominal wall. Herbert Thoms, of New Haven, Connecticut, has devised a modification which is of great value. With the patient on her back, or in the lithotomy position, one finger is passed into the vagina to the foetal head in the anterior fornix. An assistant with a pelvimeter now measures the distance from the uppermost part of the buttocks to an easily available point on the examining hand, outside the vulva. Withdraw the hand, measure the distance from this point to the end of the finger and subtract this from the first measurement. This will give the distance from the vertex to the buttocks, or half the length of the child.

I have recently measured about twenty cases in this way and found the results surprisingly accurate when the baby was measured after birth.

Charles B. Reed, of Chicago, induces labour in two thirds of his cases. From his measurements, as just described, he decides on the date of maturity. He has the patient enter the hospital on that date, introduces a rubber bag and gets the labour over. The average time being eight hours and eight minutes. We would not all agree to any procedure so radical. Good results may be obtained in perhaps ninety-nine cases out of every one hundred by ordinary methods, but it is the hundreth case we try to save. By these tests, cases of protracted gestation, and cases where the child is abnormally large from other causes, could be recognized, labour induced, and the end results much improved.

Just a few words about the means used to induce labour. The patient may be put in the lithotomy position, a douche given, a speculum introduced, the cervix gently drawn down, the gloved finger introduced, and the membranes separated as far as can be reached with the finger. A large dose of castor oil is given, and

as soon as the bowels begin to act twenty to twenty-five grains of quinine in divided doses. The danger of sepsis from this method should be very slight.

In the few cases in which it fails, the membranes may be ruptured, or a bougie introduced by Krause method, after which the cervix and vagina are packed. Labour will start in about thirty hours after either of these methods.

THE annual report of the Provincial Hospital of Nova Scotia, recently issued by Dr. J. V. Anglin, medical superintendent, states that the number of cases under care and treatment during the twelve months totalled seven hundred and ninety-four. In addition the military authorities requested the institution to take in soldiers belonging to the district, who suffered from mental ailments, so that, throughout most of the year, from ten to fifteen such cases had been looked after. Of the one hundred and sixty cases admitted the past year, one hundred and forty were natives of the province; one hundred and forty-eight were Canadians by birth, twenty-seven were of Acadian stock; one hundred were Protestants. Since the hospital was opened for mental patients the total number admitted has been 8,430; men 4,840, and women 3,590. Of this total 3,291 cases have left the hospital apparently restored to health, and 2,801 persons have died, the majority after years of residence.

A FURTHER REPORT UPON DIPHTHEROID INFECTION OF WOUNDS

WITH A NOTE UPON THE FREQUENCY OF DIPHTHEROID BACILLI IN
CASES OF URETHRITIS AND PROSTATITIS

BY R. M. JANES, M.B., *Captain, C.A.M.C.*

AND

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Pathologists to Granville Canadian Special Hospital, Buxton, England

ABOUT four months ago a routine investigation of wounds infected with diphtheroid organisms was begun here, with a view to corroborating, or otherwise, the combined report of Canadian pathologists recently published in June, 1918, in the *Bulletin* of the Canadian Army Medical Corps, and then undergoing publication. This report was compiled as a result of an article which appeared in the *JOURNAL* of the Medical Association for September of 1917 by Majors J. G. Fitzgerald and D. E. Robertson, of Toronto. In view of the fact that practically all of the cases sent to this hospital showing open wounds had some bone injury, and had, in many cases, undergone prolonged treatment in primary hospitals before being sent here, it seemed that we were dealing with a type of cases not available for investigation in most military hospitals. It is also of interest that these are the cases which are being returned to Canada while their wounds are continuing to discharge, and that they are, therefore, much the same type of case as those reported on by the Toronto investigators, and perhaps differed somewhat from the cases examined by the investigators of the combined report.

The following technique was employed: A sterile cotton swab was rubbed well over the surface of the wound and sent to the laboratory by the medical officer in charge of the case. This swab was planted on a tube of Loeffler's blood serum, and the inoculated tube incubated for a period of eighteen hours. Smears were then made from the growth obtained and stained

with methylene blue, as well as by Gram's and Neisser's method. This was carefully searched under the microscope for Gram-positive bacilli showing diphtheroid arrangement. If diphtheroid organisms were found a loopful of growth from the original culture, at a place where the majority of the colonies were of the character of those produced by diphtheroids, was emulsified by thorough shaking in a tube containing about 4 c.c. of bouillon. A loopful of this broth was then smeared on a plate of neutral nutrient agar, which was incubated for twenty-four hours, when suspicious colonies were fished. If no likely colonies appeared the process was repeated, and this time a loopful was also smeared on a plate of Loeffler's blood serum, as *bacillus diphtheriæ* are occasionally hard to grow on agar. The agar was used as routine because, being a transparent medium, it is easier to fish the colonies, and, moreover, the diphtheroids grow quite well on it. Any suspicious colony was inoculated on a tube of Loeffler's blood serum and the tube incubated. This growth was next day examined for purity, and, if pure, the sugar tubes inoculated from it. Sugar reactions were always carried out on Hiss's serum water, to which 1 per cent. of the desired sugar was added. Before the sugar reactions were finally read each tube was planted again on agar, in order to ensure that latent contamination had not occurred. Sugars were incubated for four days before final readings were taken. It was found by experience that this time was quite sufficient.

CHARACTERS OF GROWTHS

On plain agar diphtheroids produce in twenty-four hours small pin-head colonies, translucent and lenticular on naked-eye examination, under the low power of the microscope appearing finely granular, with a slightly irregular margin. On Loeffler's blood serum, colonies have the same general characteristics, but grow somewhat larger. Colonies always tend to remain discrete.

Pure cultures of diphtheroids on serum slants are more profuse than the growths ever obtained with true Klebs-Loeffler. Cultures kept at room temperature develop the creamy appearance noted by Captain Adams in the combined report. The growth is moister than that of Klebs-Loeffler, and in some cases, where heavy, becoming almost slimy. Cultures of *bacillus diphtheriæ* kept under similar conditions do not lose their characteristic appearance. Similar to Klebs-Loeffler cultures, those of diphtheroids can be kept for at least four months, and at the end of that time good growths are obtained on subculture.

We have been unable to detect any consistent difference between the morphology and staining of diphtheroids and true Klebs-Löffler bacilli. All strains of the former encountered by us stain well by Neisser's method, although usually the granules are larger. Generally speaking, diphtheroids are shorter than *bacillus diphtheriæ*. Grown on different media, they show the pleomorphism so characteristic of Klebs-Löffler.

All the diphtheroids which we have isolated from wounds have produced acid from dextrose, lactose, saccharose, maltose, lævulose, galactose, and have failed to ferment dextrin and mannite. Acid production in lactose is somewhat slower than in the other positive sugars. They may all be considered as falling under the *bacillue hoagi* type (Morse, 1912). One diphtheroid isolated from an acute otitis media complicating a case of influenza during the recent epidemic showed the sugar reactions of true *bacillus diphtheriæ*. On animal inoculation it proved avirulent, and belongs, therefore, to the class of *bacillus quasi-diphthericus* (combined investigation). Sugar reactions have been controlled on each batch of sugar media prepared by cultures of Klebs-Löffler isolated from the throats of clinical cases of diphtheria. These have always fermented all the above sugars with the exception of saccharose and mannite.

For animal inoculation a twenty-four hour neutral broth culture has been employed. Guinea-pig No. 1 was inoculated in the subcutaneous tissue of the abdomen with 2 c.c. of the culture. Guinea-pig No. 2 was similarly inoculated with 2 c.c. of culture, which, however, had remained in contact with 1,500 units of diphtheria antitoxin at room temperature for a period of one hour. In the case of wound diphtheroids of a few pigs, No. 1 showed slight œdema after twenty-four hours, amounting to a tumour as large as a bean. But no general reaction was observed in any case. At the end of three days this local reaction had always subsided. In the case of true *bacillus diphtheriæ*, death of pig No. 1 occurred in from twenty-four to seventy-two hours. Pig No. 2 showed no local or general reaction. Autopsy findings were in all cases typical. Virulent Klebs-Löffler was in one case isolated from the pleural fluid of a pig which had received *bacillus diphtheriæ* isolated from a wound. (It may be noted that the pleural effusion consisted of clear, straw-coloured fluid, not bloody fluid, as reported by some observers.)

In all we have examined swabs from one hundred and twenty-nine cases, eighty-two of which, or 63·5 per cent., showed diph-

theroid organisms. Of these, thirty were isolated in pure culture at intervals during a period of four months. Three of these proved to be true Klebs-Löffler, and twenty-seven wound diphtheroids—that is, 10 per cent. of the isolated organisms were *bacillus diphtheriæ*, and assuming that this is a fair proportion, 6.4 per cent. of the wounds were infected with *bacillus diphtheriæ*.

We give below brief clinical notes on the three cases infected with *bacillus diphtheriæ*, and on three infected with wound diphtheroids.

Case 1. No. 1005736 Pte. T., wounded, Passchendaele, November 11th, 1917. Shrapnel wound, outer surface of left arm. Wound excised and dressed at casualty clearing station the same day. Although the original wound was small, it continued to discharge until March, 1918, when it healed, leaving the arm apparently well in every way. About the first week in May, 1918, wounded area became swollen, red, painful, and tender. Swelling incised, much pus freed, and a piece of shrapnel came away in the dressing. The wound continued to discharge, and considerable sloughing took place, leaving a dirty ulcer. A swab taken May 20th, 1918, shows the Klebs-Löffler. The following note was made on his medical history sheet one week later: "Ulcer slightly larger than a half-crown, with a granulating, red base. Slight purulent discharge, slightly offensive; edges of wound are overhanging, but healthy. There is no local tenderness, pain, or redness. Epi-trochlear gland is swollen and tender. General condition of patient good." This patient was returned to Canada, being on his way before the organism was proved.

Case 2. Pte. S. Following shell wound right leg, at Passchendaele, October 10th, 1917, laid out in "No Man's Land" for five days. He contracted trench feet, and later gangrene of the right leg and toes and heel of left foot occurred. Right leg and four toes of left foot were amputated November 11th, 1917. In February, 1918, remaining toe was amputated and stumps of toes and left heel cleaned. The wound continued to discharge, and heads of metatarsal bones of third and fifth toe were removed on March 5th, 1918. Up to this time eusol and Carrel-Dakin fluid were used for dressing. On March 13th, 1918, swab from wound showed diphtheroid bacilli, later proved to be true Klebs-Löffler, along with streptococcus and staphylococcus. At this time the following description of the wound was entered: "Copious quantity of yellowish-white pus discharging, and wounds shows definite membrane, swelling and œdema extends beyond the ankle. Pa-

tient complains of very little pain." Dressings were now changed to flavine three times a day, with bichloride baths. 5,000 units of diphtheria antitoxin was administered, followed, however, by rather severe anaphylaxis. No sensitizing dose was given in this case. Progress under this treatment was rapid, and on April 30th, 1918, the following note was made on his medical history sheet: "Very slight discharge; healthy granulations cover the base of the wound. Epitheliation is proceeding rapidly along the margin." Progress was marked to complete healing.

Case 3. No. 790639 Pte. C. Received shrapnel wound of right forearm, with comminuted fracture of the ulna, on February 13th, 1918. Progress of the wound was, apparently, slow. On May 5th, 1918, had operation, with removal of scar, sequestra, and shrapnel fragments. Wound stitched, and an iodoform gauze drain inserted. Five days later a note on medical case sheet states: "Wound healing nicely. No purulent discharge (except where drain is applied)." Progress was rapid for about three weeks, when healing slowed up. On June 21st, 1918, a swab from wound showed diphtheroid bacilli, later proved to be true Klebs-Löffler. At this time wound had progressed to a superficial ulcer, which showed a definite firm membrane, and exhibited no tendency to heal. Flavine dressings three times a day were now instituted, and 6,000 units of antitoxin administered, three days later 5,000, and two weeks later 10,000 units. (A sensitizing dose of one-half-cubic centimetre of serum was administered before the first dose of 6,000 units. No anaphylactic reactions were obtained.) The membrane showed some tendency to loosen after each dose of antitoxin, but healing was slow, and swabs from the wound taken at intervals up to the time when complete healing occurred on July 21st, 1918, showed pure cultures of *bacillus diphtheriæ*.

Case 4. No. 781344 Pte. McD. Sustained shrapnel wounds at Passchendaele, October 26th, 1917, affecting anterior aspect left shoulder, and left side of neck; the damaged tissue was excised at casualty clearing station, and later, after removal to base, some necrotic bone taken from head of humerus, and free drainage of pus established, which had collected in lower angle of scapula. At this time contracted erysipelas in left arm, but following this wounds began to improve gradually.

On admission to the hospital May 7th, 1918, the shoulder wound extended from below middle of clavicle to the outer part of the upper third of arm, with some discharge. X-ray report indicated shrapnel fracture involving head of humerus, with some

fragments in this region and in soft tissues about glenoid. Entry of June 8th, 1918, on medical history sheet states wound has unhealthy look, with greyish, dry membrane covering same. On this date we had occasion to examine this wound, and found the membrane to be rather firm, thick, and extending practically over the entire wound. Several swabs were taken from the edges of the membrane, cultures of which revealed streptococcus and an organism typically Klebs-Loeffler in morphology and staining. Pure cultures of the latter gave sugar reactions of wound diphtheroid and not *bacillus diphtheriae*. Wound treated with flavine, the membrane later coming off with the dressing, leaving a sound granulating base. Patient later invalided to Canada.

Case 5. No. 719696 Pte. S. Flanders casualty of October 26th, 1917, by rifle bullet. Wound of entrance 2 inches below head of right fibula, and of exit inner side of upper third of adjoining bone. These were cleaned and bones set in casualty clearing station. Later, at base, wounds incised for free drainage of pus and splints applied, leaving window for dressings. On reaching this hospital patient had a discharging wound on inner side of head of tibia, $2\frac{1}{2}$ inches below knee-joint; x-ray revealed cavity in inner surface, upper end of tibia. Wet bichloride dressings and rubber drainage applied. On June 19th, 1918, developed scarlet fever. Bacteriological examination of wound swabbed at this date showed staphylococcus and a diphtheroid. Pure culture of latter proved to be a true wound diphtheroid. Wound healed later, and general condition of patient much improved.

Case 6. No. 215679 Pte. N. Received gunshot wound, left leg, November 10th, 1917, with fractures of the tibia and fibula. The leg was opened and drained and shrapnel removed at casualty clearing station. Wound apparently never completely healed, and on March 14th, 1918, a note on medical case sheet says: "Middle portion of wound on anterior surface of leg still discharging." X-ray report a few days later says: "Areas of rarefactions, sequestra, and shrapnel dust still present." It was not thought wise to attempt operation, because the wound showed a tendency to flare up every few days. On April 4th, 1918, scar tissues were dissected away, necrosed tibia curetted, and several small sequestra removed. A swab from wound on May 5th, 1918, showed diphtheroid bacilli; later proved to be true wound diphtheroid. At this time there was a scar 7 inches long on antero-internal surface of left leg, with a small unhealed portion on the centre, from which a sinus led to another opening on the antero-external

surface. There was a slight purulent discharge. Flavine dressings three times a day were instituted, and the progress of the wound was satisfactory.

It will be seen from a summary of the above case reports that wounds infected with diphtheroids differed in no wise clinically from those from which true *bacillus diphtheriae* was obtained, except that they were, perhaps, more amenable to treatment. It will be noted that membranes were found in both types of cases. The three cases of diphtheroid infection are reported as a fair representation of all the cases we have examined.

During the conduction of a large number of bacteriological examinations for the venereal clinic here we have been struck by the large number of chronic cases of urethritis, littritis, and prostatitis, showing diphtheroid bacilli as the predominant organism.

Of one hundred and eighty cases examined, one hundred and five, or 58 per cent., showed diphtheroid bacilli. We have isolated seven cultures from the above, and these show the same morphological staining and cultural characteristics, also sugar reactions, as the wound diphtheroids. We have seen at least a few cases of acute urethritis due to diphtheroid organisms, and are of the opinion that in chronic infections of this locality these organisms are extremely important. It is also of interest in suggesting a possible source of at least some cases of diphtheroid infection in wounds. The first, to our knowledge, who called attention to the existence of urethral diphtheroids was Hine in 1913,* but we were unprepared by anything we have encountered in the literature to find them so common in the male genito-urinary tract.

SUMMARY

1. 63·5 per cent. of open wounds examined in this hospital have shown diphtheroid organisms.

2. Judged from those cases in which pure cultures were obtained, 6·4 per cent. of open wounds in this hospital show infection with *bacillus diphtheriae*.

3. Clinically, it is impossible to diagnose between diphtheroid and true diphtherial infection of wounds. A membrane does not necessarily indicate the presence of *bacillus diphtheriae* wounds.

4. It is not possible to distinguish between diphtheria bacilli and wound diphtheroids by morphological characters.

*Jour. of Pathol. and Bact., 1913, 18, 75.

5. Only by sugar reactions obtained from pure cultures can diphtheroid organisms be distinguished from true Klebs-Loeffler and only after positive animal inoculation is it advisable to diagnose diphtheria in wounds.

6. Flavine appears to have given better results than any other form of local treatment used here.

7. It is advisable to administer diphtheria antitoxin in cases of diphtheria in wounds; here the importance of giving a sensitizing dose in cases of war wounds due to their having received previous injections of serum is emphasized. If this rule is not followed severe anaphylactic reactions will occur in some cases.

A CAMPAIGN to raise \$100,000 to aid the Laval Tuberculosis Hospital has been inaugurated in Quebec. Two large public meetings have been held which were attended by crowded audiences of representative citizens. Among those who addressed the meetings were the Lieutenant-Governor, the Auxiliary Bishop of Quebec, Mgr. Roy, the Premier of Quebec, the President of the Laval Hospital Board of Directors and others. The object of the campaign was explained by Grand Knight Turgeon, who opened the first meeting in St. Peter's Hall. He told how the directors of the Laval University had come to the Knights of Columbus in their dire need of assistance to pay off the debt of the institution, and help them to carry on this great charitable work in the interests of humanity. He pointed out that the Laval Tuberculosis Hospital was free to all, irrespective of creed or nationality.

PROPOSED REVISION OF CONSTITUTION AND BY-LAWS OF THE ASSOCIATION

BY H. B. SMALL, M.D.

Ottawa

IN 1908 our present by-laws were adopted and an entire change made in the policy and work of the Association. It was then we entered into our affiliation with the Provincial Associations; the publication of the JOURNAL was begun; and an annual fee imposed upon all members.

These changes were not due to any sudden inspiration. They had been gradually forcing themselves upon the notice of our members. The membership had greatly increased; the attendance at meetings had doubled and trebled; and it had become evident that a more active and responsible course must be pursued. Probably that which had the greatest influence in promoting the change was the opening of the Western Provinces and their assumption of a provincial status. This placed all health and medical affairs under their jurisdiction and there quickly followed the formation of Provincial Medical Associations, which completed provincial organization throughout Canada.

A changed environment for our Association then prevailed, and, as the parent society, we realized our responsibilities. We became the central connecting body, binding all together, and with the enthusiastic support and affiliation of all the Provincial Associations, our new constitution was established.

The constitution we adopted has served our purpose in a remarkable degree, but during the intervening ten years, certain amendments and additions have been made from time to time, many details have been found inefficient, and experience has shown where improvement in our procedure may be effected. In the proposed revision it will be found that there are only a few changes of any importance. It is rather a re-arrangement, which includes the amendments that have been adopted, and advantage has been taken of the opportunity to make such changes as experience has taught us to be desirable; by-laws that have proved defective have

From the presidential address delivered at the combined meeting at Hamilton, Ontario, June, 1918.

been made more definite and others have been amplified to facilitate the work of the Association.

Constitution. In the Constitution there has been added a clause providing for the adoption of a Code of Ethics and its proper presentation to all members. Many years ago we adopted the code of the American Medical Association, and, in turn, our affiliated associations have accepted that of our Association. but nothing has been done to keep in touch with any alterations or amendments to the original Code and the whole matter has fallen into neglect. It is unnecessary to dwell upon the desirability of having a proper guide and the necessity of keeping it prominently before the profession. There are many who have never had an opportunity of becoming familiar with its tenets, and there are many others who are not aware of its existence. Its importance is such that I would suggest the appointment of a special committee to consider the whole matter and prepare an up-to-date code for the guidance of the profession in Canada.

Another addition is the introduction of a clause forming the past-presidents of the Association into a Judicial Committee. To them will be referred all subjects of dispute between individual members, or affiliated bodies, and such other matter as may be thought proper by the Association. As constituted, this committee should have the confidence of all. It will be in a position to report in an unbiased and impartial manner, and will remove from the general meetings all matters that might lead to dissention and discord.

Administration. The general management, as heretofore, is vested in the Executive Council. Our experience has confirmed the advantage of this small responsible body in carrying on the business of the Association. The important feature that all must bear in mind is the careful selection of the members of this Council, and that responsibility rests upon the individual members of the Association. There have been many complaints of our present by-law for the selection of this committee, and many other methods have been suggested, but it is not thought advisable to make any material change. The chief objection has been that members, who are actively interested in the work of the Association, and familiar with its details, may be unavoidably absent from the annual meeting, and cannot be elected. To overcome this very evident defect, the by-laws now allow the Council to elect three additional members whom it may consider desirable and who may render good service during the interval between the annual meetings.

Membership. Closely associated with and dependent upon our

membership is the condition of our finances. As the annual fee of our members is our only source of revenue, it is evident that our membership must be increased three and even four-fold. All our efforts are hampered by the want of funds. We should be in a position to maintain at least two officials sufficiently recompensed to give their whole time and energies to the Association. Our JOURNAL, which we had hoped would have been a source of revenue, has proved a financial burden. A contract to last ten years has bound us hand and foot, and the JOURNAL is issued at a loss. Fortunately the contract is nearing an end, and it is to be hoped that a more advantageous agreement may be reached, and a more popular publication issued. There are many ways in which we may augment our membership, but there are none that would be as effective as to have each affiliated association make our JOURNAL its official organ.

Committees. Our general sessions and our several sections have been satisfactory at all times, but the same cannot be said of our Committee work. There have been exceptions. Many Committees have presented reports, that have borne the impress of ability and of much care and study, but taken generally, they have not received the attention that their importance demanded, and too often no report has been forthcoming. These reports should be a most valuable and influential part of our work. We can conceive the Legislative Committee each year reporting all new laws and any changes in each province that may affect the profession or of any change that may be proposed. The same in regard to the work of the Educational and other committees. Such reports, carefully prepared and annually published, would furnish the latest information upon each special subject. In the course of time each would become a chapter of historic interest and be invaluable for reference.

Sections. At the annual meeting, the general session for the reception of addresses, etc., and the formation of sections, will remain as hitherto; but it is proposed that certain changes be made in the management of the sections. At present a new Chairman and Secretary is appointed each year by the local Committee of Arrangements. Those selected may have very little knowledge of the work of their section, and not be conversant with the duties required of them. Under the new by-laws the Sections become of a more permanent character. The officers are selected by the members from among themselves. They will be elected at the close of the meeting for the following year, and will be responsible for the work of their respective sections. The purpose of this change

is to enable the section to select those who are particularly interested in its work, and thus secure a greater continuity of work than under the old method.

Associate Societies. Medical Associations are our only affiliations. The question has recently arisen as to the affiliation of other bodies, having a like purpose, but including laymen in their membership. As the fundamental principle of our Association is that its membership should be restricted to the members of the medical profession, it is impossible to approve of such a union, but it would appear reasonable, and even desirable, that we should be allied with associations working on lines similar to our own; particularly when they have the benefit of laymen who may have special qualifications, and who view the problems from a different standpoint to our own. There does not appear to be any reason why they should not be accepted as Associated Societies, and whilst each carried on its work independently of the other, by the receiving of delegates, we would learn of work accomplished and of any special purpose they might have in view. The Canadian Public Health Association, the Canadian Associations for the Prevention of Tuberculosis; the Canadian Association on Mental Hygiene; and many such, are doing good work gathering the opinions of the public better than we have an opportunity of doing, and might become associated with advantage to all.

These are a few of the more important changes that have been thought necessary. There are probably many details that are not sufficiently clear, and should be more definitely stated, or some important matter has been overlooked and omitted. It is desired that whatever the criticism may be, suggestions of improvement should be forwarded to the committee, that they may be given proper consideration before the next annual meeting, when the whole subject will be finally dealt with.

If we grant that our organization is complete, our Executive and Committees working efficiently, and that our ideals are attained, is our work to cease? Are we to be content with the annual gathering, and our interest to lapse for another year? Should each one rest satisfied with papers and reports presented by others, and take no part in promoting the work of our Association? Its success and standing, the quality of its work, and the influence it exerts, is dependent upon the individual members. To accomplish anything, it must have their personal interest in the routine work. But attention must not be restricted to medicine and surgery. It should range into the many allied subjects of socio-

logical interest which rightly are part of our work; public health in its various aspects; housing problems; child welfare; prenatal and maternal care; and the mental, tubercular, and venereal plagues.

It is one of our proud boasts that the profession of medicine is something more than a money-making vocation; that our ideals are high, and that our daily life and service are toned and softened by their influence. The training received during the study of medicine, the independent, untrammelled, yet busy college life, crushes petty foibles and broadens our outlook upon life. Add to this the experience gained during years of practice, and there results a wealth of wisdom too often unrecognized. It follows that upon the many questions of national importance the members of our profession are best fitted to advise. Untrained laymen, earnest in their endeavour, are struggling with these questions. We must not forget that governments have enacted laws for our benefit, many privileges have been accorded the profession, and in return there is imposed upon each one a duty and a responsibility to his country.

The same obligation falls upon our Association as a corporate body, and this phase of our work has been sadly neglected. We have not recognized the importance of our Association, and have failed to place it in the position it should occupy in the national life of Canada. As the representative body of the profession, it is our duty to offer an opinion upon these public questions that should be final. Our pronouncements should be sought for, not only by the public, but by authorities and by governments.

In these changing times, and in the greatly changed world that is to follow this war, many weighty and vexed problems will have to be solved. Many may be satisfied to leave the burden upon those in authority, but a share of responsibility rests upon each one of us, and to each falls a share in the moulding of what is to be. The more varied his opportunities and the greater his ability to lead, just so much more must he respond to the call of duty. The financial, commercial, and labour forces are preparing for the change, but the sociological problems are not as yet properly approached. It is here that the views and opinions of the profession of medicine will be most valued, and the influence of the individual member makes him one of the strongest forces in forming public opinion. The principles of national efficiency are now being fully appreciated. The public is beginning to realize that many of the pet fads, which in the past have fitfully interested the well-meaning, are really of the greatest importance in the upbuilding of our country.

PROPOSED REVISION OF THE CONSTITUTION AND BY-LAWS*

CONSTITUTION

ARTICLE I.—TITLE.

This society shall be known as the Canadian Medical Association.

ARTICLE II.—OBJECTS.

The objects for which the Association is established are the promotion of the medical and allied sciences, and the maintenance of the honour and the interests of the medical profession by the aid of all or any of the following:

(a) Periodical meetings of the members of the Association in different parts of Canada.

(b) The publication of a periodical journal which shall be the official organ of the Association.

(c) The occasional publication of transactions or other contributions to science.

(d) Grants of sums of money, out of the funds of the Association, for the promotion of the medical and allied sciences in such manner as may from time to time be determined.

(e) And such other lawful things as are incidental or conducive to the attainment of the objects of the Association.

ARTICLE III.—CODE OF ETHICS.

The Code of Ethics of the Association shall be such as may be adopted by the Association from time to time. An official copy shall be kept in the possession of the secretary and shall be open to inspection at all times. A copy shall be sent to all members upon joining the Association.

*Prepared by the committee nominated at the Hamilton meeting, June, 1918.

ARTICLE IV.—MEMBERSHIP.

The Association shall be composed of ordinary and honorary members. Ordinary members shall be (a) regularly qualified medical practitioners who do not subscribe to any special dogma, and (b) those engaged in teaching or research work.

Honorary members shall be persons who have distinguished themselves and have risen to eminence in medicine or the allied sciences.

ARTICLE V.—AFFILIATED SOCIETIES OR ASSOCIATIONS AND
BRANCH ASSOCIATIONS.

All Provincial, Inter-Provincial Medical Associations or Societies and other Medical Bodies, may, by special resolution of said Medical Society or Association, become branches of or affiliated with the Canadian Medical Association, by subscribing to its Constitution, By-Laws and Code of Ethics, and by securing the approval of the Executive Council. They shall submit a copy of their Constitution and By-Laws and such amendments as may be made from time to time.

ARTICLE VI.—MEETINGS.

The meetings of the Association shall be held annually at such time and place as may be determined by the Executive Council; and upon such other occasions as may be considered desirable.

ARTICLE VII.—OFFICERS.

The officers of the Association shall be a President, a Vice-President for each Province, a Secretary and a Treasurer, and an Executive Council, to be elected in accordance with the By-laws of the Association. These officers shall serve for one year, or until their successors are elected and installed in office.

ARTICLE VIII.—EXECUTIVE COUNCIL.

The Executive Council shall be the business body of the Association. It shall consist of delegates elected by affiliated bodies; by the Army and Navy permanent Medical Services; by the Canadian Medical Association, as provided for in the By-laws; and three members of the Association elected by the Council at its first meeting. The President, Vice-Presidents, Secretary and

Treasurer of the Association shall be *ex-officio* members of the Council. It shall conduct its business in accordance with the By-laws of the Association and shall present a report at each annual meeting. The members shall remain in office, and conduct the affairs of the Association, for one year or until their successors are elected.

ARTICLE IX.—ADVISORY COUNCIL.

The past-presidents of the Association shall form an advisory council to consider such questions as may be submitted by the Association; they shall act as a Judicial Committee when requested. They may offer advice, or make protest at any time, to the Association. The Convener of this Committee shall be the retiring President.

ARTICLE X.—FUNDS.

Funds for the purposes of the Association shall be raised by an annual assessment upon each ordinary member; from the Association's publications; and in any other manner approved of by the Executive Council. All funds received are to be transferred to the Treasurer and by him deposited in some responsible banking institution. The Treasurer shall give a bond to the Executive Council for the safe-keeping of all funds in his possession.

The Association year shall be the calendar year.

ARTICLE XI.—AMENDMENTS.

This Constitution may be amended by the Executive Council, at any meeting, after due notice of the proposed amendment has been given to each member, by the Secretary, in writing, and adopted by a two-thirds vote of those present and voting; provided that it shall not become effective until sanctioned by the Association in general session, after notice has been given by publication in the Journal.

BY-LAWS

CHAPTER I.—MEMBERSHIP.

Sec. 1.—Any physician may be elected a member of the Canadian Medical Association by the Executive Council upon forwarding:

- (a) a written application for membership on an approved form;
- (b) a statement showing endorsement by his Provincial

Association; provided that where no such Association is organized, he may be elected a member after being nominated by two members of the Association in good standing;

(c) the payment of the annual subscription, and subscribing to the Constitution and By-Laws of the Association.

Sec. 2.—Honorary members, after nomination, shall be elected by the Executive Council and approved of by the Association in general session.

Sec. 3.—So long as a member conforms to the Constitution and By-laws, he shall retain his membership and have all the privileges and powers thereof, provided that any member whose subscription shall not have been paid on or before the 31st December of the current Association year, shall, without prejudice to his liability to the Association, be suspended from all privileges of membership, and at the end of the succeeding year, if the arrears be still unpaid, he shall, *ipso facto*, cease to be a member, provided also that any member whose name has been removed from his Provincial Medical Association for unprofessional conduct, shall, upon representation from such Association, have his name removed from this Association.

No member shall, except in case of his death, or expulsion, or of his ceasing to be a member under the previous provisions of this article, cease to be a member without having given previous notice, in writing, to the Secretary of the Association not less than one month before his next annual fee is due, of his intention in that behalf, and having paid all arrears of subscription due by him.

Sec. 4.—Any delinquent member having once failed to comply with the sections of this article, unless absent from the country, shall have his name erased from the Register of Members of the Canadian Medical Association, and shall not be restored to membership until all such dues, as may be determined by the Executive Council, have been paid, and satisfactory evidence produced that he retains his membership in an affiliated society or association, if admitted through such channel.

Sec. 5.—No member shall take part in the proceedings of the Association, nor in the proceedings of any of the sections thereof until he has properly registered his name and paid his annual dues for that and previous years.

Sec. 6.—Medical practitioners residing outside of Canada, and other men of science of good standing, may attend the annual meeting by invitation of the President or the Executive Council, or at the discretion of either upon a letter of introduction from an absent member of the Association. They may, after proper intro-

duction, be allowed to participate in the discussions of a purely scientific nature.

Sec. 7.—Medical students may be admitted to either the general meetings or to the meetings of any of the sections thereof, but shall not be allowed to take part in any of the proceedings. They shall be vouched for by a member of the Association to either the President or the General Secretary.

Sec. 8.—Associations and Societies whose membership comprises laymen as well as members of the medical profession, and whose work pertains to national welfare, may, upon application, be admitted as Associated Societies, and shall appoint delegates to attend the meetings and report upon the work of their Association.

CHAPTER II.—ANNUAL MEETING.

Sec. 1.—The place of meeting shall be decided upon by the Executive Council, and shall be announced as early as possible. The details of the meeting shall be in the hands of the Committee of Arrangements under the direction of the General Secretary of the Association.

Sec. 2.—The meetings shall be held in general session and in such sections as may be determined upon by the Executive Committee.

Sec. 3.—The President shall preside at all general meetings. In his absence, or upon his request, one of the Vice-Presidents shall preside.

Sec. 4.—The order of business for all meetings shall be:

- (a) Calling the meeting to order by the President.
- (b) Addresses of welcome and response.
- (c) The report of the Committee of Arrangements.
- (d) Reading of minutes of last session.
- (e) Reception of reports.
- (f) Election of Association members to the Executive Council.
- (g) General business.

Sec. 5.—The Rules of Order which govern the proceedings of the House of Commons of Canada shall be the guide for conducting all meetings of the Association.

Sec. 6.—All addresses delivered at any annual meeting shall immediately become the property of the Association, to be published or not, in whole or in part, as deemed advisable, in the official journal of the Association. Any other arrangement for

their publication must have the consent of the author or of the reader of same and of the Executive Council.

CHAPTER III.—MEETINGS OF SECTIONS.

Sec. 1.—The sections to be held at any annual meeting shall be determined by the Executive Council. In default of their so doing, this duty shall be discharged by the Committee of Arrangements.

Sec. 2.—Each section shall hold its meeting at such time and place as the Committee of Arrangements shall decide.

Sec. 3.—Each section shall elect a Chairman and a Secretary for the following year, at its last session during the annual meeting, and they shall assume office at once.

Sec. 4.—The Chairman shall preside at all meetings of the section, and with the aid of the Secretary, shall arrange for the papers and other business of the section.

Sec. 5.—The Secretary shall keep a correct account of the transactions and record them in a special section minute-book provided by the General Secretary. The Chairman must verify and sign the minutes which must be returned to the General Secretary at the close of the meeting.

Sec. 6.—All papers, essays, photographs, diagrams, etc., presented in any section, shall become the property of the Association, to be published in the official journal of the Association or not, as determined by the Executive Committee, and they shall not be otherwise published except with the consent of the author and of the Executive Committee.

Each author of a paper read before any section shall, as soon as it has been read, hand it with any accompanying diagrams, photographs, etc., to the Secretary of the section before which it has been presented, who shall endorse thereon the fact that it has been read in that section, and shall then hand it to the General Secretary.

CHAPTER IV.—OFFICERS.

Sec. 1.—The general officers of the Association shall be a President; a Vice-President for each Province of the Dominion of Canada, who shall be the Presidents of the Provincial Associations; a General Secretary; and a Treasurer. The offices of Secretary and Treasurer may be combined.

Sec. 2.—Any five members of the Association may hand to the General Secretary, in writing, the name of a member whom they may wish to nominate for any office.

Sec. 3.—All general officers of the Association, except the President, shall be appointed by the Executive Council. The President, after nomination by the Executive Council, shall be elected by the Association in general session.

Sec. 4.—THE PRESIDENT-ELECT shall be installed in office by the retiring President, at the close of the last general session of the annual meeting at which he is elected.

Sec. 5.—THE PRESIDENT shall preside at the general sessions of the Association and at meetings of the Executive Council, and shall perform such duties as custom and parliamentary usage require. He shall deliver the Presidential Address at either the first or second general session of the annual meeting held under his Presidency, as he may decide. He shall be *ex-officio* member of all committees. For the meeting over which he is to preside, the President shall appoint a Committee of Arrangements consisting of five or more members who shall reside in the place at which the Association is to hold its annual meeting. He shall also name the chairman of this committee, who shall be responsible for the performance of its duties.

Sec. 7.—THE VICE-PRESIDENTS shall assist the President in the performance of his duties. The Vice-President of the Province in which the meeting is held shall be the first Vice-President of the Association.

Sec. 7.—THE GENERAL SECRETARY shall also be the Secretary of the Executive Council of the Association. He shall give due notice of the time and place of all annual and special meetings, by publishing the same in the official journal of the Association, or, if necessary, by notice to each member. He shall keep the minutes of the General Sessions of the annual meetings of the Association, and the minutes of each meeting of the Executive Council, in separate books, and shall provide minute books for the secretaries of the different sections, which he shall see are properly attested by both chairmen and secretaries thereof. He shall notify the officers and members of committees of their appointment and of their duties in connection therewith. He shall conduct all correspondence of the Association and shall publish the official programme of each annual meeting. He shall preserve and index the archives, the public transactions, essays, papers, and addresses

of the Association, and shall perform such other duties as may be required of him by the President or Executive Council. The General Secretary shall be *ex-officio* a member of all committees. For his services the General Secretary shall receive a salary which shall be fixed by the Executive Council. All his legitimate travelling expenses to and from the annual meetings and other places ordered by the Executive Committee shall be paid for him out of the funds of the Association.

Sec. 8.—THE LOCAL SECRETARIES shall assist the General Secretary at the annual and special meetings, and shall perform the duties of Corresponding Secretaries for the respective provinces they are elected to represent; these duties shall be performed under the direction of the General Secretary.

Sec. 9.—THE TREASURER shall receive and collect the annual fees, and demands of the Association, from the members. He shall be the custodian of all moneys, securities and deeds belonging to the Association, and shall only pay out moneys on an order drawn by the General Secretary and approved by the Executive Committee whose chairman shall also sign all such orders. The Treasurer shall give to the Executive Council a suitable bond for the faithful discharge of his duties, and shall receive for his services a salary to be fixed by the Executive Council.

CHAPTER V.—EXECUTIVE COUNCIL.

Sec. 1.—At the first general session of each and every annual meeting of the Canadian Medical Association, fifteen members thereof, who shall be present at that annual meeting, and representing, as far as possible, the various Provinces, shall be elected by ballot, after nomination, to act on the Executive Council for one year; provided that any one already elected a delegate by an affiliated society or association shall not be at that meeting elected a member of the Executive Council. The President of the Association shall name three tellers to conduct this ballot. No one shall serve as a member of the Executive Council who has not been a member of the Canadian Medical Association for at least two years.

Sec. 2.—The Army and Navy permanent Medical Services and each affiliated Branch, Society, or Association, shall be entitled to elect, in addition to its President, who becomes an *ex-officio* member, one delegate to serve on the Executive Council for its membership in the Canadian Medical Association of from fifteen to fifty; two delegates for its membership from fifty-one to one

hundred and fifty; three delegates for its membership from one hundred and fifty-one to three hundred; and thereafter one delegate for every three hundred of a membership above three hundred; provided that no one delegate shall represent more than one affiliated society or association to which he may belong. Every delegate from an affiliated society or association shall be required, before acting on the Executive Council, to have entered his name on the annual register of the Canadian Medical Association, paid his annual subscription to the Association, and deposited a certificate with the General Secretary of the Association, duly signed by the President and Secretary of the affiliated society or association, from which he has been elected a delegate.

Sec. 3.—At its first meeting, the Executive Council shall elect three members in addition to those already elected by the Association.

Sec. 4.—The meetings of the Executive Council shall be held daily during the annual meeting of the Association; and at such other special time and place as the President may think necessary during the intervals between the annual meetings. For all specified meetings due notice shall be sent to each member specifying the objects of the meeting.

Sec. 5.—The Executive Council shall have charge of all properties and of all financial affairs of the Association. It shall, through its officers, conduct all the business and correspondence, and shall be responsible to the Association for the proper performance of its duties. It shall keep a record of the transactions of all its meetings and of the receipt and expenditure of all funds, and shall report upon the same to the Association at its first general session, which report shall be published in the Journal after the annual meeting. In the case of a vacancy in any office, on account of death or otherwise, during the interval between the annual meetings of the Association, it shall have the power to elect successors. Before the close of the annual meeting it shall nominate a President and place of meeting for the next annual meeting, and present a list of all standing and special committees and the members thereof. It shall preserve all addresses, papers and reports that have been delivered before the Association, and shall have power to publish or omit any address, paper or report, or part thereof, as it may think proper, in accordance with the wishes of the author.

Sec. 6.—In order that the business of the Executive Council may be facilitated during the interval between the annual meetings of the Association, the Executive Council may appoint a committee

of seven, from among its members, which shall be known as the Executive Committee. In all the business affairs of the Association it shall represent the Executive Council and to it, under the direction of the President, shall be delegated all the rights and powers of the Council. The President shall be a member of the committee *ex-officio* and shall select its chairman. The General Secretary shall be Secretary. The Executive Committee shall report to all meetings of the Executive Council and at such other times as the President may request. The President, or five members of the Executive Council, may call a special meeting at any time at which the Executive Committee may be annulled or changed.

CHAPTER VI.—COMMITTEES.

Sec. 1.—The Committees shall be (a) Standing and (b) Special.

Sec. 2.—STANDING COMMITTEES shall be appointed by the Executive Council, which will also select their chairman. They shall be as follows:

1. A Committee of Arrangements.
2. A Committee on Necrology.
3. A Committee on Medical Legislation.
4. A Committee on Medical Education.
5. A Committee on Amendments to the Constitution and By-laws.

Sec. 3.—SPECIAL COMMITTEES may, from time to time, be appointed by the Executive Council or by the Association in general session. They shall select their own chairman and shall perform the duties for which they are called into existence.

Sec. 4.—All committees shall report in writing to the Executive Council prior to the annual meeting of the Association. They shall not expend any moneys nor incur any indebtedness without the sanction of the Executive Council.

Sec. 5.—The Committee of Arrangements shall arrange for the transportation of members to the annual meeting and for their accommodation at the meetings. They shall provide halls for all the meetings; arrange all details and facilities for the proper conduct of the meetings; and, under the direction of the President and General Secretary, arrange for all addresses and business of the General Sessions of the Association.

Sec. 6.—To the Committee on Necrology shall be assigned the duty of collecting, as far as possible, the obituaries of members dying since the last annual meeting.

Sec. 7.—To the Committee on Legislation shall be referred all matters pertaining to Provincial and Federal Medical Acts. It shall report on all legislation relating to medical affairs in the various governments, and upon all like matters proposed by medical councils.

Sec. 8.—To the Committee on Medical Education shall be referred all matters pertaining to medical colleges and medical education. It shall report upon the condition of medical education throughout Canada and upon any proposed change, and suggest methods for the improvement of medical education.

Sec. 9.—To the Committee on Amendments to the Constitution and By-laws shall be referred all matters relating to the subject, before action thereon by the Executive Council.

CHAPTER VII.—ELECTIONS.

All elections shall be by ballot, after nomination, and a majority of the votes cast shall be necessary to elect a candidate. Should there be more than two nominees for any position, the one having the lowest number of votes shall be dropped and a new ballot proceeded with. This procedure shall be continued until one of the nominees receives a majority of all votes cast, when he shall be declared elected.

All resolutions shall be carried by an open vote unless a ballot is requested.

CHAPTER VIII.—AMENDMENTS.

At any meeting of the Association in general session, the Executive Council may be requested to make any addition or amendment to the By-laws as may appear to be desirable. Such addition or amendment not to become effective until considered and passed by the Executive Council, after due notice has been sent in writing to each member of the Council.

Any alteration in the By-laws originating in the Executive Council, and adopted by that body, shall not become effective until sanctioned by the Association in general session, due notice of the proposed change being published in the Journal.

Editorial

THE ANNUAL MEETING OF THE ASSOCIATION

IT is very important that every member of the Association should make a special effort to be present at the Quebec meeting June 25th to 27th. This is the first opportunity the profession has had of coming together since the war, as the result of which many problems requiring discussion have arisen.

It is necessary to absorb into the ranks of active practitioners an enormous number of physicians who have been absent for varying periods. Although the major portion of this work must fall on the provincial and county societies, yet much good may be accomplished by this Association taking a leading part in the discussion of the question as to how these physicians may be reinstated in their practices.

The long distances between the different centres in Canada have produced a provincialism that should not exist in a field such as medicine. As physicians, we have a bond of union that should eradicate such narrow ideas far more than it does. It was hoped that the Canadian war-effort would have developed the national idea more than can be seen at the present time. A large attendance at meetings such as ours will always assist in keeping us out of this groove of provincialism, which has always impeded our progress as an Association. It is desired in no way to minimize the usefulness of the provincial and county societies. Only by their strength can we have a solid foundation for the Canadian Association. Where they are weak and neglected, the Association gets little support, and the profession in these parts correspondingly suffers.

Most of the provinces have recently been engaged in attempting to solve problems intimately connected with the

medical profession. The Federal Government is at present engaged in forming a Department of Health. It is safe to say that in no instance has the profession been able to exert the influence it should, in shaping this legislation along the lines of greatest benefit to the public, as well as to themselves. This would not have been the case if the Medical Societies had had a united and enthusiastic profession behind them.

To make an annual meeting a success we must have a large number present from every province. To those of the older members, who are financially able to make the trip, a special appeal is made. You who have prospered during recent years should let nothing interfere with your coming.

Our appeal for papers has been fairly well met, but there is yet room for further contributions to the programme. Those of our members who have not yet sent in their contributions, and who may desire to do so, are requested to forward them to the Secretary immediately.

POST-GRADUATE COURSES FOR MEDICAL OFFICERS

TO all graduates in medicine who served as medical officers in the war just finished, the necessity of some form of post-graduate training is evident. Many of them had no civilian practice before enlisting; none of them, since enlisting, have had an opportunity of doing anything but military work, and even that has often been of a purely executive character, and far removed from either the practice of medicine or surgery. Others again went overseas as undergraduates, came back to finish a hurried course, and returned again to the war, without much hospital training. Every one has had ample opportunity to forget all he ever knew of diseases of women and children.

It is therefore being recognized by some of the teaching centres that their part in post bellum reconstruction work should be to offer "refresher" courses to the members of

the Army Medical Service, who have so nobly played their part in the great conflict—courses which would fit these officers to begin, or to resume, their duties as civil practitioners, and in some instances, aid them to pass the licensing boards.

Such courses have been established by the teaching bodies in the London and Edinburgh Schools and became operative on April 15th of this year.

The medical faculties of McGill and Toronto Universities, realizing the great advantages both to the returning medical officers and to the public, have resolved to make this summer's post-graduate course especially adapted to meet the needs of these officers. These courses will begin about the middle of June and are planned to extend over a period of three months. It is understood that only a nominal fee, to cover the cost of material, will be charged. The services of the teachers will be entirely gratuitous.

These universities are to be congratulated on their foresight in attempting to supply these needed courses, and it is to be hoped that the officers will take advantage of this opportunity to re-establish themselves into civil life again. The time-tables have been carefully worked up with the assistance of returned men, so that essentially practical courses are assured. These are designed to appeal to those who wish to take up some special line of work as well as to the men who intend to take up general practice.

It is to be hoped that some really serious attempt will be made to give adequate instruction in treatment. This has always been the weak point in the teaching of our universities as well as in the vast majority of text-books. The outdoor departments should be used for these courses far more than the wards, especially for teaching men who are going into general practice. The ailments they will see here are the ones they must build up their reputations on. These medical officers have had considerable experience in examination of fit as well as unfit men, but many have little idea of how the ailments seen in the outdoor departments should be treated.

The Association

ANNUAL MEETING, QUEBEC, JUNE 25TH TO 27TH

PRELIMINARY PROGRAMME

Address in Medicine:—W. S. Thayer, M.D., Professor of Medicine, Johns Hopkins Hospital, Baltimore.

Address in Surgery—Jasper Halpenny, M.D., Associate Professor of Clinical Surgery, University of Manitoba.

Addresses in Public Health—J. W. S. McCullough, M.D., D.P.H., Chief Officer of Health, Province of Ontario; and J. D. Pagé, M.D., Medical Superintendent, Quebec Immigration Hospital.

SECTION OF MEDICINE

A. D. Blackader, Montreal—"Acidosis and actomoniasis."

D. A. Craig, London—"Physical examination of the chest."

G. G. Campbell, Montreal—"Lantern demonstration of skin diseases."

H. B. Anderson, R. W. Mann and H. M. Tovell, Toronto—"Interrelationship of mouth infection, neurasthenia and exophthalmic goitre."

H. A. Farris, St. John, N.B.—"The tuberculous hospital and dispensary."

W. F. Hamilton, Montreal—"Pneumothorax in influenza epidemic."

J. C. Meakins, Montreal—"Chlorine gas poisoning—late results."

A. H. Gordon, Montreal—"Internal hydrocephalus and the Nonne-Froin syndrome."

F. G. Finley, Montreal—"Influenza and Sepsis."

H. B. Cushing, Montreal—"The importance of secondary infections in the contagious diseases."

E. C. Levine, Montreal—"Indications and results of blood transfusion."

James Third, Kingston—"Danger signals in cardio-vascular affections."

Fletcher McPhedran, Toronto—To be announced.

Lionel M. Lindsay, Montreal—"Infantile tetany-spasmophilia."

SECTION OF SURGERY

A. Primrose, Toronto—"Tumours of the kidney."

G. E. Armstrong, Montreal—"Focal infections; ileal and colonic stasis."

C. L. Garner, Fernie, B.C.—"Cystoscopy."

A. E. Garrow, Montreal—"Report with remarks on a case of sub-total gastrectomy for diffuse carcinomatous infiltration (malignant 'leather bottle' stomach)."

C. B. Keenan, Montreal—"Secondary extra-dural hæmorrhage of the cord."

E. M. Eberts, Montreal—"Foetal adenomata in the thyroid and their relation to hyperthyroidism."

W. G. Turner, Montreal—To be announced.

R. C. Powell, Montreal—"Diagnosis of surgical diseases of the kidney."

Fraser B. Gurd, Montreal—"The surgical treatment of chronic chest sinuses."

N. J. Maclean, Winnipeg—To be announced.

Herbert Bruce, Toronto—"Efficiency in an army medical service."

SECTION OF PUBLIC HEALTH

T. H. Whitelaw, Edmonton—"The practical aspects of quarantine for influenza."

M. M. Seymour, Regina—"The Saskatchewan Union Hospital."

C. M. Hincks, Toronto—"Mental hygiene and the medical practitioner."

W. F. Roberts, St. John, N.B.—"A provincial ministry of health."

G. S. Mundie, Montreal—"The problem of the mental defective in the Province of Quebec."

Helen MacMurchy, Toronto—"Child welfare."

Eugene Grenier, Montreal—"La lutte anti-tuberculeuse est une lutte sociale: le rôle des gouvernements; le rôle des initiatives privées pour le pays."

J. A. Beaudouin, Lachine—"Epidemiology."

J. E. Laberge, Montreal—"Town planning and civic authorities."

J. D. Pagé, Quebec—"Hygiene publique et conscience publique."

P. H. Bryce, Ottawa—"The scope of a Federal Department of Health."

H. Montizambert, Ottawa—To be announced.

Gordon Bates, Toronto—"Some aspects of the social hygiene problem in Canada."

SECTION OF EYE, EAR, NOSE AND THROAT

L. deV. Chipman, St. John, N.B.—"Nasal affections in relation to general medicine."

G. Sterling Ryerson, Toronto—"On ocular imbalance."

S. Hanford McKee, Montreal—"The enlargement of the conjunctival sac by the use of dental compound."

G. H. Mathewson, Montreal—To be announced.

W. G. M. Byers and F. T. Tooke, Montreal—"The surgical treatment of immature senile cataract."

H. D. Hamilton, Montreal—"Benign growths of the larynx in children."

R. Craig, Montreal—To be announced.

E. Hamilton White, Montreal—To be announced.

SECTION OF OBSTETRICS AND GYNÆCOLOGY

Papers to be announced.

The following names of contributors to the programme have been received too late for insertion in their proper Section:

Medicine: Drs. Fortier, Leclerc, Lessard, Rousseau, Vallée, Guérard and Jobin.

Surgery: Drs. Simard, Dagneau, Ahern, Lemieux, Pineault and Dubé.

Public Health: Drs. Cuillard, Savard, DeVarennnes, Savary, Palardy, Lafrenieres, Beaudry and E. Pelletier.

HOTELS

The following are the rates quoted us by the hotels at Quebec:

Chateau Frontenac:

	With bath	Without bath
Single room.....	\$3.00 to \$5.00	\$2.00 to \$3.00
Double room.....	5.00 " 8.00	3.50 " 5.00
Suites (2 people).....	6.00 " 8.00	
Suites (4 people).....	9.00 " 12.00	

No reduction is made in the rates of \$3.00 and \$2.00 quoted for single rooms, the former with, and the latter without bath. From all other rates quoted, a reduction of fifty cents will be allowed to members of the Association attending the convention.

Victoria (Palace Hill)—American plan, \$3.00, \$3.50 and \$4.00.

Clarendon (corner St. Anne and Gordon Street)—American plan, \$3.00 and \$3.50.

Ste. Ursule House (corner St. Louis and Haldimand Streets)—American plan, \$3.50 and \$4.00.

As announced previously, there will be no special railway rates this year.

We are informed by President Grondin that the privileges of the Quebec Golf Club have been extended to the members of the Association during the period of the meeting.

Obituary

AN APPRECIATION OF THE LATE DR. RICHARD A. REEVE

ALTHOUGH our obituary columns in the March number contain a reference to the late Dr. R. A. Reeve, we feel that the loss of this prominent figure in medical circles deserves more than passing notice. Following the appearance of the March number we received from one of his old friends the following note of appreciation, which we are glad to publish.

Dr. Reeve, one of the best known characters in the ranks of Medicine in Canada, died in Toronto on January 7th. His name was a household word, and all classes regarded him as one of the most delightful personalities Canada has ever had in the medical profession.

He was born in Toronto in 1842; was educated in Victoria College, Cobourg, and graduated in Arts from the University of Toronto in 1862. He afterwards took up Medicine in Queen's College, Kingston, and was elected a Fellow of the Royal College of Physicians and Surgeons. In 1872 he became a lecturer on Diseases of the Eye and Ear in the Toronto School of Medicine, and was elected Dean of the Faculty of Medicine in 1896. This position he occupied until 1908 when he resigned.

As a university man he was simply indefatigable in his endeavours to serve his Alma Mater, and was a leading spirit in many movements. He was one of the few Canadians selected to fill the honoured position of President of the British Medical Association when it met in Toronto in 1906. His appearance carried at once to any observer the impression of gentleness, amiability, and manliness, and to know him was to love him. His ethical sense was of the finest kind possible, and his consideration for others was one of the most pleasing elements in his character. While it is true that few men in the hurly burly of life escape criticism by enemies, which seem to be a necessary part of any man's experience, yet in the case of Dr. Reeve it may truly be said that while he stood out in a most determined way for his ideals he did

it with so much tact that all men recognized his honesty of purpose, and could not help respecting his palpably religious fervour.

Dr. Reeve's death is a distinct loss to the medical profession, and his tragic end will long be regretted by all who knew him.

Convocation Hall at the University of Toronto, which was erected largely as a result of his enthusiasm, will always stand as a monument to his memory.

As a skilled physician Dr. Reeve had very few equals on the continent of America, and his opinions were respected in the United States as much as they were in Canada.

DR. WALLACE CLARKE

DR. WALLACE CLARKE, gold medalist in Arts, and graduate in Medicine of McGill University in 1871, died at his residence in Utica, March 17th, after an illness of about two weeks. Dr. Clarke made a high reputation for himself in his city and in his state. He was health officer of the city of Utica for many years. He was one of the first to use formaldehyde as a disinfectant in place of the old hot air system previously in use. He was also one of the first to direct attention to the house fly as a common carrier of disease. Although he had a large practice, he found time to enjoy the social side of life, and took a great interest and keen delight in all outdoor sports.

Besides his widow he leaves one son, Dr. T. Wood Clarke of Utica, who enjoys a high professional reputation; and a sister living at present in Montreal.

DR. WILLIAM BURT

DR. WILLIAM BURT died at his home in Paris, Ontario, on March 14th, in his seventieth year. He was born in South Dumfries, and, after graduating from the Toronto School of Medicine, he took a post-graduate course in Brooklyn Hospital. Later he joined the United States army as a surgeon and saw active service on the Texas frontier. He returned to Canada and took up practice in Paris, where he has remained for the last forty-seven years. He was highly esteemed in the medical profession, a member of the Toronto senate and a former president of the Ontario Medical Association. After his return to Paris he always identified himself with public affairs, having been chairman of the Board of Education, and for some years president of the Children's Aid Society. In his passing all classes keenly feel the loss of a true friend.

DR. A. POUSSETTE

DR. A. POUSSETTE, one of Sarnia's most prominent physicians, died on March 6th, at the advanced age of eighty-four. He graduated at McGill University in 1860 and went to practise in Corunna in the same year. On the death of his brother-in-law, Sir Arthur Buck, in Sarnia, he moved to that place to take up his brother-in-law's practice, in the year 1864. In 1895 he was appointed medical superintendent of the House of Refuge. In 1896 he was elected mayor of the city, and in 1905 he was appointed medical health officer. He was also a prominent Oddfellow. A loyal citizen and civic worker, he gave a helping hand to every work of progress in the community where he so long resided, and many who attended his funeral recalled the things accomplished by the deceased in his time of greatest activity.

DR. W. B. KENNEDY

THE recent death of Dr. W. B. Kennedy came as a great shock to the community. He had been a well-known practitioner in Guelph for the last thirty-five years. Though not in robust health, few of his friends realized that his condition was serious. He passed away suddenly on the evening of March 17th. Dr. Kennedy graduated in medicine at Queen's University and following graduation became house surgeon in Kingston Hospital. Subsequently he practised his profession in Brainard, Minnesota, for a short time and then settled in Guelph, where he spent the remainder of his life. He was a man of kindly spirit, a friend to many who needed a helping hand. He took an interest in all matters pertaining to the welfare of the community and for some time served in the city council. Those who knew him intimately had a very high regard for his gifts of mind and sterling character, and a wide circle of friends will miss his genial presence.

DR. A. WALLACE MASON died at Pomona, California, on March 20th. He came to Toronto in the early sixties and for many years carried on a practice in that city, but was unable to continue owing to ill health. He is survived by his wife, four sons and three daughters.

DR. EDWARD McGRATH, a well-known practising physician of Peterboro, passed away recently, after a short illness, from heart

failure. He died at St. Joseph's Hospital, an institution in which he had always taken a keen interest and of which he was superintendent for a number of years. Dr. McGrath came to Peterboro about thirty years ago and was associated with the late Dr. O'Sullivan, subsequently acquiring his practice which he carried on up to the period of his death. His ability as surgeon and physician was recognized by the members of the profession. He was a big hearted, kindly man, who did an immense amount of good in the community in which he resided.

DR. C. J. McBRIDE died at Welland, on March 2nd. He was on his way to Florida, when taken suddenly ill, so immediately returned. He was born thirty-five years ago at Cookstown, graduated from the University of Toronto, and came to Welland seven years ago; since that time he built up a large practice in the county. He had been Coroner for a number of years.

DR. GEORGE STANTON, who for forty-one years practised medicine in Simcoe, died on March 17th, at Denver, after a brief illness. He was a graduate of McGill University.

DR. JOHN WALKER died at Glencoe on March 23rd, after a serious illness of three months' duration. He was a prominent physician of the town and its medical health officer. He was connected with the various institutions of the community for over a quarter of a century.

DR. GEORGE ETIENNE CARTIER died recently at his home in Montreal at the age of forty-six. He graduated at Laval University and before entering upon practice of medicine was an interne at the Hôtel Dieu for two years. He leaves a wife and five children. Dr. Cartier had completed the twenty-third year of his practice at the time of his death.

THE death occurred, on March 22nd, of Dr. A. A. Le Blanc, of Arichat, Nova Scotia. Arichat loses one of her foremost and most progressive citizens for, on the invitation of its residents, Dr. Le Blanc went there thirty-years ago and continued in practice ever since.

DR. STEWART MACKENZIE, of Toronto, died at Bellevue Hospital recently, the result of a serious accident. The doctor

had just received his discharge from the Canadian army having been wounded and gassed in France.

DR. ANDREW BOURQUE, of Bourget, Ontario, died on March 17th. He was forty-five years of age. He practised for the last eighteen years at Bourget. He possessed many sterling qualities and his death has caused great regret.

THE following list of names announce the members of the profession who died recently of Spanish influenza and pneumonia: Dr. Lloyd A. Jones, Hamilton; Dr. E. J. Kibbe, London, Ontario; Dr. George H. Berry, Westport; Dr. Walter McInnes, Vittoria.

Miscellany

News

MARITIME PROVINCES

THE Faculty of Medicine of Dalhousie University is fortunate in having had presented to it by the Halifax Disaster Relief Commission, a large set of radiograms of injuries sustained by the victims of the great explosion.

These stereoscopic radiograms, which number over three thousand, were very skilfully taken by an expert technician, a Mr. Hollingham, but at the time of the disaster by the Naval Hospital to the medical relief department of the Relief Commission.

They form a valuable series of skiagraphic illustrations of injuries of all kinds.

They are to be stored for the present in the medical building, Carleton Street, and to be used for teaching purposes by the professors and lecturers in surgery.

THE list of successful candidates in the pharmaceutical examinations recently held in St. John, New Brunswick, has been given out by the registrar, J. B. Mahoney. Six passed in general

subjects; one in materia medica; two in chemistry; four in pharmacy; three in dispensing; three passed in all subjects. The examiners were: in general subjects, Dr. H. S. Bridges; materia medica, E. R. W. Ingraham; chemistry, M. V. Paddock; pharmacy, N. B. Smith; dispensing, A. D. Johnston.

DR. F. I. WHITE has been appointed local medical representative in Moncton by the Department of Soldiers' Civil Re-establishment and Invalided Soldiers' Commission. The Great War Veterans' Association, and other ex-soldiers in Moncton, have been advised that in future the intention is, as far as possible, to have all their cases treated in that city.

MR. W. B. FAWCETT has made a generous offer to subscribe \$10,000 towards the building and maintaining of a public hospital in Sackville in memory of the soldiers of Eastern Westmorland. Five thousand of this amount is payable to the Building Committee, and the balance, payable in five annual instalments, is for its support when in active operation. Mr. Fawcett urges co-operation in the scheme, and believes a considerable number of precious lives would have been saved in the recent epidemic, if a hospital of equal merit with those of Moncton and Amherst could have operated in or near Sackville. This would have been within a thirty or sixty minute ride of Cape Tormentine, or the remotest point anywhere of the three large parishes of Botsford, Westmorland and Sackville, as well as portions of Dorchester and Shediac.

DR. PHILIP NASE has been appointed to the staff of the Pensions Board as ear, nose and throat specialist for the province of New Brunswick.

QUEBEC

THE ravages which have been caused by tuberculosis in the province of Quebec during the past ten years were referred to by the Hon. Walter Mitchell, provincial treasurer, in moving the adoption of resolutions confirming the contract between the Provincial and Federal Government for the extension of the Ste. Agathe Sanitarium, which will be used for the next five years mainly for soldiers returning from service overseas with tubercular trouble, and afterwards entirely as a civilian sanitarium, maintained by

the province. Mr. Mitchell stated that the government fully realized that something must be done to put a check on the plague that was destroying over 3,000 victims annually. The Sanatorium at Ste. Agathe was established in 1911 and had treated seven hundred and ninety-five patients since then, having a capacity now of seventy beds, spending \$228,739 which had been voluntarily subscribed for its work. The governments jointly intend to extend the institution to two hundred and seventy-one beds, of which at least twenty will be for civilians, and a larger number, if the beds are not required for soldiers. The report dealing with statistics points out that the deaths were double the number of those who died from typhoid, measles, scarlet fever and diphtheria put together.

ALL the Laval candidates for license to the practice of medicine, in this province, eighteen in number, successfully passed their final examinations. The majority of the graduates will practise in the municipalities surrounding Quebec. The new medical men have been handed their diplomas a few months before the usual time, on account of the special regulations adopted to furnish medical men more rapidly for the army. A special summer session of three extra months was held to make up the necessary time. It is understood that the old system of three terms a year will be resumed and that there will be no summer session next year.

DR. J. A. BEAUDRY, inspector-general of the Superior Board of Health of the province, reports a considerable amount of influenza still prevalent, particularly in the country districts of the counties of Rimouski and Verchères; in the affected districts special regulations are still being observed. Dr. Beaudry also states that there is a small amount of smallpox, and that about forty rural municipalities are affected. The type is not virulent; vaccination is being widely performed by the provincial health officers.

NOTICE has been given by Hon. J. Decarie, that he will introduce this week a bill amending the Public Health Act. The bill is not yet distributed, but it is understood to make provision for preventive and curative action for venereal disease.

THE twenty-first annual meeting of the local association for Greater Montreal of the Victorian Order of Nurses for Canada, was held recently. The Order has twice faced the supreme test,

when they were called upon for emergency work at the time of the Halifax disaster and during the influenza epidemic. During the latter the Montreal staff of twelve nurses had paid 3,500 visits to over 5,500 sufferers. The average number of visits for a nurse in the city during the year was 2,588. The Order contributed in no small measure to the baby welfare work of the community. In addition to maternity work the nurses gave instruction in 1,100 prenatal cases, paying in all 8,068 visits to mothers and their babies.

DR. J. N. ROY, oculist and aurist of the Hôtel Dieu of Montreal, has received the distinction of Laureate of the Academy of Medicine of France.

ONTARIO

A FEDERAL Health Act is under consideration at Ottawa. The control of immigration by selection, the establishment of institutions for the feeble-minded, and all problems affecting the social welfare of the country will be the subjects claiming new legislation. Another probable development will result in sending representatives from Canada to Europe in connection with the medical examination of immigrants before embarkation. Dr. Clarke and Dr. Hincks, of Toronto, are likely to go to Europe late in the summer for this purpose.

A comprehensive programme has been mapped out for the members of the Ottawa Health Society by the executive; fifteen standing committees have been appointed and they will deal with all manner of problems including: Hospital co-operation in providing clinics and dispensaries for the feeble-minded, social, and other diseases; home nursing, home helps, medical relief and maternity; child welfare centres and milk stations, sick nursing, health insurance, inspection of school children; physical training of pupils and open schools for pre-tubercular children; a tuberculosis committee to co-operate with the Anti-Tuberculosis Association and May Court Club. All these activities but briefly indicate the work in prospective of the Ottawa Health Society.

THE Essex Border Utilities Commission has expressed itself in favour of a unification of the health boards of the five border municipalities of Ford, Walkerville, Windsor, Sandwich, and Ojibway and after considerable discussion decided to ask Dr. J. W. S. McCullough, of Toronto, as chief medical officer, for suggestions

looking towards a joint system of health inspection. Dr. McCullough's reply will be presented to the Essex Medical Society for further consideration. It was suggested during the conference that such an arrangement between the municipalities in the recent epidemic might have done much to reduce the total number of cases.

THE extent of the menace of venereal disease in Ontario has been rather strikingly proven by the monthly returns to the Provincial Health authorities. During December medical health officers reported one hundred and seventy-eight cases, a considerable increase over the preceding months, and January's cases show a further jump of two hundred and sixty-four cases, the increase being most noticeable in regard to syphilis. A most depressing fact in connection with the month's returns is that syphilis caused seven deaths, four of the victims being babies under a year old who died of hereditary syphilis. The influenza epidemic, though it has lost its force, is still taking a greater toll of valuable lives than all other communicable disease together. Since the beginning of October there have been 8,795 deaths in the Province from influenza. The disease at present does not seem to be afflicting any particular part of the province, practically every municipality reports cases.

THE Department of Civil Re-establishment has decided to utilize the Westminster Soldiers' Convalescent Hospital, at London, exclusively for mental cases. It will accommodate three hundred and fifty patients. Patient nows located at the Newmarket mental hospital will be transferred to London. Neurological and shell shock cases will be treated, as formerly, in general hospitals. A new sanitarium for tubercular patients is to be built at Woodbridge at a cost of \$320,000.

PREMIER HEARST has announced that the Ontario Government will issue a grant of \$119,650 for erection of buildings for the Orillia Hospital for the feeble-minded. Besides the completion of other plans this amount includes a building for patients suffering from tuberculosis and other contagious diseases. \$50,000 have been appropriated by the government for improvements to the Ontario School for the Deaf. A grant of \$150,000 towards the building of a new medical school in connection with Western University, London, has been requested of the Ontario Government by a special deputation.

THE medical staff of the Kingston General Hospital has been reorganized, and is now under the direction of Queen's University. The hospital is to be enlarged with \$100,000 given by the late Dr. James Douglas, Chancellor of Queen's, as a nucleus, and the Ontario Government, the city of Kingston and the municipalities of the district are to be asked to co-operate. The graduating class this year is the largest in the history of Queen's medical school. A number of the graduates of this last war session are medical students who served overseas in various capacities, but principally with the Queen's Hospital Corps in Egypt and France. The list of successful candidates numbers sixty-three. To L. H. Appleby, Clarendon, has been awarded the Medal of Medicine; with honour of the Medal in Surgery; and to L. S. Fallis, Millbrook, the Medal in Surgery.

THE formal opening of the New Dominion Orthopædic Hospital took place recently in Toronto. The Minister of Militia officially opened the institution. In reviewing the work of the Army Medical Corps, General Mewburn said that about 700,000 cases had been handled in hospitals overseas and in Canada, which figures were advanced to testify to the sacrifices of the medical profession during the war. He pointed out that at the time of the signing of the armistice the government was fairly able to estimate the bed accommodation in Canada, and he thought that there was now ample hospital services in Canada to take care of returning soldiers.

The new military Orthopædic Hospital is still unfinished, but of the total accommodation of 1,000 beds, already 629 are occupied. The staff of the hospital includes about one hundred and twenty-five, of whom twelve are doctors, twenty-one nurses and eight V.A.D.'s.

ON the opening of the Connaught Laboratories, in 1917, the government made a grant of \$75,000 for endowment of the laboratories, and to this amount \$25,000 has been added, making a total of \$100,000, the proceeds of which are to be devoted to investigation of problems in preventive medicine, and to endeavour to provide means whereby the incidence of and the mortality from communicable diseases may be lessened.

ARMY MEDICAL SERVICES

At an investiture at Buckingham Palace the Distinguished Service Order and Bar was awarded to Colonel Thomas Leask, C.A.M.C.

The King has presented the Red Cross, first-class, respectively to Matron Jean Urquhart and Matron Evelyn Wilson.

DR. ALFRED MASSEY, formerly of Belleville, Ontario, has won distinction in the Belgian Congo, where, as an appreciation for his services as medical officer over a battalion of native troops, he has been awarded the rank of Major, and has been decorated with the La Croix de Chevalier de Lordre Royal de Lion.

NURSING SISTER BEATRICE McDONALD, of North Bedeque, Prince Edward Island, a reserve army nurse, was awarded a distinguished service cross "For conspicuous heroism under fire". The presentation was made on March 27th in the office of the Secretary of War, Washington, in the presence of many members of the general staff. Nurse McDonald, who was stationed at a British casualty hospital, stuck to her post during a night raid by the Germans, caring for the wounded until she was struck down by a fragment of a shell, losing the sight of one eye.

DR. LYON H. APPLEBY, who spent two years overseas in Egypt and France with Queen's Hospital, is the winner of the Dr. Hoffman research scholarship in surgery, and medal in medicine, with honour of medal in surgery, at Queen's College, January 31st, 1919.

NURSING SISTER ERNESTINE CHAMPAGNE, who succumbed recently to pulmonary tuberculosis, contracted the disease while working under canvas at St. Cloud Hospital, France, and was invalided home in 1917. She was the daughter of the late Justice Champagne, and had been decorated by the French Government for distinguished service in France.

NURSING SISTER GRACE ERROL BOLTON, of Montreal, died recently at the Second Military Hospital, Leeds, England.

AN International Red Cross Conference is expected to be convened within the next three or four months, at which will be considered the extension of the powers and objects of Red Cross Societies under the Geneva Convention.

MAJOR DAVID LAW, Assistant Commissioner of the Red Cross Society in France, has resigned his position owing to his having to return to Canada. Captain D. J. Murphy, who has been rendering valuable assistance to the work in France, has been temporarily appointed as Acting Assistant Commissioner for the short period in which it is expected that the need will continue.

DURING a period of nine months in 1918 the Paris Dépôt received 12,399 cases of Red Cross Supplies and distributed 12,825 among 1,694 hospitals. During eight of those same months, 15,590 cases of supplies were received at the Boulogne warehouse and 13,427 cases were distributed. In distributing the supplies from Boulogne the Red Cross motor lorries travelled 78,619 miles.

Appointments (Canada):—Lieutenant-Colonel Percy Keith Menzies is posted for duty under the A.D.M.S., military district No. 2.

Major Robert Frederick Flegg is appointed to a Permanent Conducting Staff, and attached to the Clearing Service Command.

Lieutenant-Colonel Archibald Lorne Campbell Gilday, D.S.O., is appointed as acting D.A.D.M.S., military district No. 4, vice Major H. S. Muckleston.

Captain Walter Lawson Muir is posted for duty under the A.D.M.S., military district No. 6.

Captain Gerald Shaw Williams is posted for duty under the A.D.M.S., military district No. 10.

Lieutenant-Colonel Ethelbert Browne Hardy, D.S.O., is posted for duty as Officer Commanding, St. Andrew's Military Hospital, vice Major T. D. Archibald.

Major Benjamin Leslie Guyatt is posted for duty as Officer Commanding Base Hospital, Toronto, vice Lieutenant-Colonel Ethelbert Browne Hardy, D.S.O.

Captain Louis Joseph Adolphe Mignault, is appointed to the staff of the A.D.M.S., Embarkation, military district No. 6.

Lieutenant Romeo Jules Vallee, returns to military district No. 4 from military district No. 6.

Captain William Goldie is posted for duty under the A.D.M.S., military district No. 2.

Major Harvey Lee Jackes is posted for duty under the A.D.M.S., military district No. 2.

Captain Harold St. Clair Wismer returns to military district No. 1 from military district No. 2.

Captain Charles Edmund Flatt is appointed to a Permanent Conducting Staff and attached to the Clearing Services Command.

Major Thomas Logan Towers is posted for duty under the A.D.M.S., military district No. 1.

Captain Charles Francis Dunfield is posted for duty under the A.D.M.S., military district No. 1.

Captain Arthur Martin is posted for duty under the A.D.M.S., military district No. 4.

Lieutenant Garnet George Stonehouse is appointed under the A.D.M.S., Embarkation, and attached to the Clearing Services Command.

Captain Roy Gordon Brain is posted for duty under the A.D.M.S., military district No. 1.

Captain Duncan Alexander Campbell is posted for duty under the A.D.M.S., military district No. 2.

Major Charles H. Robson is posted for duty under the A.D.M.S., military district No. 2.

Lieutenant-Colonel Daniel Paul Kappele, D.S.O., is posted for duty as Officer Commanding, Brant Military Hospital.

Colonel Frederick Samuel Lampson Ford, C.M.G., ceases to be employed as A.D.M.S., Embarkation, and resumes duty in the branch of the D.G.M.S., Militia Headquarters, Ottawa.

Major William Boyd McKechnie, is posted for duty at the Vancouver Military Hospital.

Promotions:—Captain Ernest Herbert Young to be Major while commanding the Military Hospital, Cobourg.

Captain Clarence B. Farrer, to be Major, 11th March, 1919.

The following Lieutenants to be Captains:—Lieutenant Roy Dickson Lindsay, 1st January, 1919; Lieutenant Daniel Alexander Carlyle, 1st December, 1918.

Returned from Overseas:—Captain A. E. Naylor, Captain D. A. Campbell, Captain D. Black, Captain E. H. Marcellus, Captain M. U. Valiquet, Major James Carlyle Fyshe, Major James Albert Dickson, Captain William Lewis Colquhoun MacBeth, Captain

Henry Stephen Gooderham, Major Robert Flegg, Colonel H. A. Bruce, Captain C. K. Wallace, Colonel W. H. Delaney, Captain F. B. Day, Lieutenant-Colonel J. S. Jenkins, Captain R. P. Borden, Major C. H. Robson, Major E. H. Mayhood, Major John Wesley Pilcher, Lieutenant-Colonel G. E. Kidd, Captain D. A. Warren, Major R. J. McEwen, Captain C. L. Douglas, Captain A. R. Alguire, Captain L. P. Churchill, Captain N. Monk, Captain W. Hale, Major F. W. Tidmarsh, Captain J. A. Reid, Major J. F. Irving, Major W. H. MacDonald, Major A. Beech, Captain H. A. W. Brown, Captain W. D. Cruikshank, Major K. E. Cooke, Captain C. E. Hanna, Captain R. F. Greer, Captain H. V. Malone, Major J. A. Briggs, Lieutenant-Colonel T. M. Leask, Captain R. M. Harnie, Captain (acting Major) G. E. McCarteney, Captain George Douglas Jeffs, Captain W. C. Givens, Major (acting Lieutenant-Colonel) C. Hunter, Major W. G. Lyall, Captain J. Bilodeau, Captain C. O. Banting, Major G. W. Hall.

Book Reviews

PRINCIPLES OF BACTERIOLOGY. By ARTHUR A. EISENBERG, A.B., M.D., director of laboratories, St. Vincent's Charity Hospital. 198 pages, illustrated. Price, \$1.75. Publishers: C. V. Mosby Company, 801 Metropolitan Building, St. Louis, 1918.

This little book is intended as an introduction to Bacteriology for such readers as hospital nurses and, one might add, third year medical students too. The definitions and classifications are particularly good, especially the classification of the varieties of immunity as given on page 58.

Technical terms are not avoided, but when used are fully explained. The Greek is, however, here and there open to some question as for instance when we are told on page 20 that "geneo" (for geunao) is "I produce"; or on page 59 that eryteos (for erytheos) is red. The latter may be a misprint.

Surely the account of Infantile paralysis on page 179 does not do justice to Flexner's work? In this account we have the expression "solution of this disease" when it is the problem of the

disease that is meant. One is glad to see historical data so freely given; but we hope that "1718" is a misprint for 1798, the date of the introduction of vaccination by Jenner. Jenner was not born in 1718. "Sir Wright" ought to be Sir Almroth E. Wright.

UNITED STATES ARMY X-RAY MANUAL. Authorized by the Surgeon-General of the Army. Prepared under the direction of the Division of Roentgenology. 506 pages, with 219 illustrations. Price, \$4.00. Publishers: Paul B. Hoeber, 67 East 59th Street, New York, 1918.

This is not merely a handbook for the skiagraphist, it is an exhaustive treatise on the theory and practise of Roentgenology.

The illustrations are numerous and very clear. Every possible difficulty is dealt with in an authoritative but condensed manner. The introductory discussion on the physics of the X-rays is particularly good. The skiagraphy of no part of the work is omitted; and a section is devoted to the therapeutic use of the rays.

MENTAL DISEASES. A Handbook Dealing with Diagnosis and Classification. By WALTER VOSE GULICK, M.D., assistant superintendent Western State Hospital, Fort Steilacoom, Washington. Illustrated, 142 pages. Price, \$2.00. Publishers: C. V. Mosby Company, St. Louis; McAlinsh & Co., Toronto, 1918.

This book is truly multum in parvo, a book of definitions and illustrations. If there was nothing in it except the illustrations, it was worthy to be published.

The author makes no attempt to give a text-book describing all the varieties of abnormal mentality; but he describes in a vivid and condensed style a sufficiently large number of the types more frequently met with to make his book an excellent supplement to the large and complete treatises on what used to be called "Insanity". If it had contained some description of the psychology of the diseased mind at different ages, its value would have been still further enhanced.

We object to the phrase "mental metabolism" on page 40 because "metabolism" means exchange of material and not merely any kind of change; probably cerebral metabolism is meant. A possible disappointment to some may be that there is practically nothing said about treatment.

PHYSICAL AND OCCUPATIONAL RE-EDUCATION OF THE MAIMED.

By JEAN CAMUS, and others. Authorized translation by W. F. CASTLE, Surgeon, R.N. With articles on British Institutions by SIR ARTHUR PEARSON, Bart., and others. 195 pages. Price, 5/- net. Publishers: Baillière, Tindall & Co., 8 Henrietta Street, London, 1918.

Just as in the great War, science was abused in order to take life, so as a result of the war is science being appealed to, to repair the ravages of shot and shell. This book might be called the romance of re-education. Few people are aware of the magnitude of this work of the re-education of men suffering from every form of sensory and motor disability in almost every country which was visited by the demon of Germanism. The mechanisms in place of limbs are not only ingenious but evidently practically efficient.

THE WASSERMANN TEST. By CHARLES F. CRAIG, A.M., M.D., Lieutenant-Colonel, Medical Corps, United States Army. Published with authority of the Surgeon-General, United States Army. 239 pages, illustrated. Price, \$3.00. Publishers: C. V. Mosby Company, St. Louis; McAinsh & Co., Toronto, 1918.

This is an exhaustive monograph on a test of immense utility in which the subject is systematically dealt with in due historical order.

It is remarkable that, valuable as the test is, the biochemistry of it should be as yet only imperfectly known.

There is in the volume a great deal of matter of the utmost importance to those engaged in treating cases of syphilis at all stages of the disease, but the general practitioner will find much in the book that will help him.

CONCERNING SOME HEADACHES AND EYE DISORDERS OF NASAL ORIGIN. By GREENFIELD SLUDER, M.D., clinical professor and director of the department of laryngology and rhinology, Washington University Medical School, St. Louis. 272 pages, 115 illustrations. Price, \$7.00. Publishers: C. V. Mosby Company, St. Louis; McAinsh & Co., Ltd., Toronto, 1918.

This is an exhaustive monograph which cannot fail to be of value to the rhinologist. Its illustrations are numerous and admirably clear.

